
Soil Survey

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Decatur County Georgia

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SOIL SURVEY OF DECATUR COUNTY, GEORGIA

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COUNTY SURVEYED

Decatur County is in the southwestern corner of Georgia (fig. 1). Flint River and Spring Creek form the southern one-third of the western boundary and the Georgia-Florida State line the southern boundary. Bainbridge, the county seat, is 35 miles northwest of Tallahassee, Fla., and 55 miles southwest of Albany, Ga. The county has a total area of 612 square miles, or 391,680 acres.

The county includes three outstanding physiographic divisions: (1) The rather high rolling upland, or higher dissected plain, in the southeastern part; (2) the flat or low plain of the northwestern and northern parts; and (3) the first and second bottoms, principally along Flint River, and narrower strips along Spring, Mosquito, and other creeks. The upper and lower plains are marked by a well-defined ridge, or escarpment (pl. 1, A) running in a northeast-southwest direction, passing through Climax, Fowlstown, and Faceville, and, in a general way, following the River Junction branch of the Atlantic Coast Line Railroad.

The area south of this ridge, or escarpment, which occupies the southeastern one-third of the county, has an undulating to gently rolling relief and is very rolling and sloping near or adjacent to the natural drainageways or first bottoms. The larger streams have carved rather deep comparatively narrow valleys, whereas the smaller streams and intermittent drainageways flow in V-shaped valleys. Only a few sinks or poorly drained areas occur in this part, except

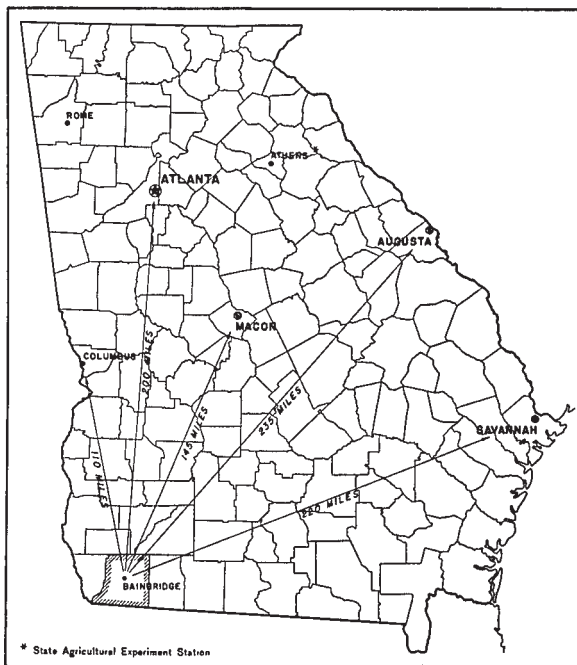


FIGURE 1.—Sketch map showing location of Decatur County, Ga.

along the streams. An area comprising about 25 square miles south and west of Faceville on the upper plain is flatter than the remainder of this plain. This particular area is drained by few streams but contains numerous sinks into which water drains during rainy seasons.

The flat or lower plain comprising the northwestern two-thirds of the county has an almost level to undulating relief, characterized by shallow sloughs and numerous undrained depressions, or sinks. Along Flint River are some low first bottoms subject to overflow, and paralleling these are second bottoms, or terraces. Most of the second bottoms have a level to slightly undulating relief, although the surface is modified in places by sinks, old stream channels, and swales and, locally, by wind-blown sand ridges and knolls.

The rolling country in the southeastern part has a considerably higher elevation than the area of smoother relief on the lower plain in the northern part. The elevation¹ at Faceville is 296 feet, at Fowlstown 289 feet, and at Climax 277 feet above sea level. The general elevation of the lower plain is indicated by the elevations of 110 feet at Bainbridge and 104 feet at Brinson. Almost all of the lower land, particularly the first bottoms along the lower reaches of Flint River, are less than 100 feet above sea level.

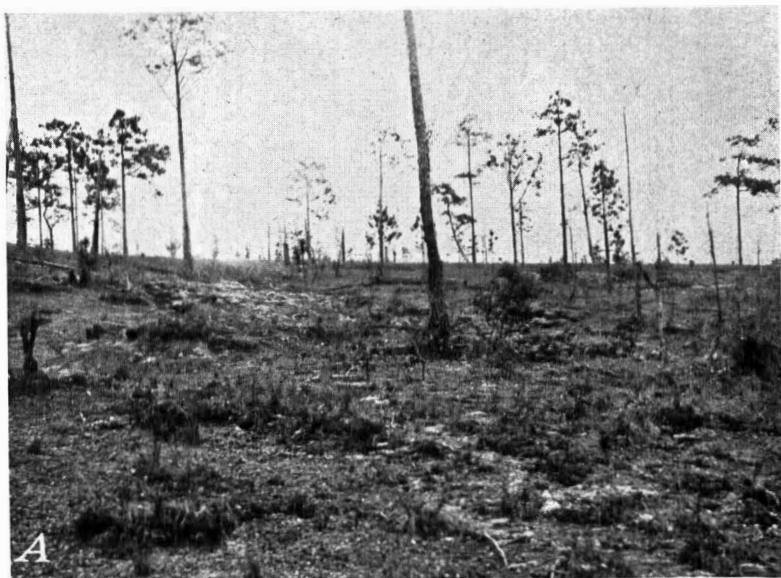
The drainage waters of Decatur County escape through both surface and underground drainage systems. The southeastern part of the county has a well-defined dendritic drainage system, including Swamp, Attapulcus, Little Attapulcus, and Willacoochee Creeks, and their numerous tributaries, which ramify all parts of that section and afford excellent drainage for all areas except the swamp along the streams. These streams flow south into Little River outside the county. In the southwestern part northwest of the escarpment and paralleling Flint River from Fowlstown to the southwestern corner of the county, the land is the most deeply dissected and drainage ranges from good to excessive for the greater part of the soils. All the drainage waters flow into Flint River.

The northern two-thirds of the county has no well-defined streams, with the exception of Flint River, which flows through the central part, and Spring Creek along the western side. The broad almost level to undulating areas are drained through the numerous sinks and depressions into subterranean channels in the underlying limestone. This section includes several sloughs, or broad flat valleys, and numerous upland depressions and sinks, some of which serve as drainage-ways during times of heavy rainfall.

Within the county are four fairly large permanent lakes—Douglas Lake, Black Lake, Cane Water Pond, and Open Pond—and a few small ponds, all which are fed by small streams and springs. Intermittent lakes and ponds may occur during wet seasons.

Decatur County supported predominantly an original forest of longleaf pine, together with some loblolly and shortleaf pines. The longleaf pine covered most of the lower plain and some of the larger upland areas on the upper plain, and the loblolly and shortleaf pines occupied the more rolling parts of the upper plain and the escarpment. The growth along the larger creeks and the river was mainly cypress, which still constitutes an important part of the forest, to-

¹ GANNETT, H. A DICTIONARY OF ALTITUDES IN THE UNITED STATES. U. S. Geol. Survey Bull. 274, ed. 4, 1,072 pp. 1906.



A, Erosion along escarpment where trees and grass will not grow well; *B*, reforesting Norfolk sand with longleaf pine.



A, Longleaf pine boxed for turpentine; B, turpentine still.

gether with considerable swamp chestnut oak, Spanish oak, hickory, sweetgum, black gum, black pine, magnolia, bay, red elm, soft maple, and yellow poplar. Practically all of the original timber growth has been cut, and much of the present forest cover consists of a scattered to rather thick growth of longleaf (pl. 1, *B*), loblolly, and slash pines, together with some blackjack, turkey, southern red, white, and post oaks, and some scattered dogwood, persimmon, and cypress trees.

The first settlements in the section now included in Decatur County were Fort Hughs (now Bainbridge) and Fort Scott, both of which were established in 1816 by Georgia State troops. At that time the area now comprising Decatur County was a part of Early County.

Decatur County was organized from a part of Early County in 1823. In 1825 a part of it was added to Thomas County, in 1905 another part was taken to form a part of Grady County, and another part was taken in 1921 to form part of Seminole County. The pioneers were descendants of the earlier settlers of the State coming west seeking new territory. Later settlers came in from the Carolinas. Most of the early settlers established homes near Flint River and Spring Creek, where transportation by water was available. Steamboats were operated on Flint River by 1826, furnishing transportation for farm products to distant markets.

According to the 1930 census, the population was 23,622, of which 17,481 were classed as rural. The density of the rural population was 30 persons a square mile. Of the rural population 11,352 were classed as rural farm and 6,129 as rural nonfarm. Bainbridge, the county seat, located near the center of the county, includes all the urban population of 6,141 inhabitants. The population included 11,812 Negroes, or 50 percent of the total.

Some of the hardwood trees along the larger streams are now being cut for crates and staves, and some of the hickory is being cut and sold for use in the manufacture of wagons and farm machinery. Some of the young pines are cut and shipped to Panama City, Fla., for pulpwood. Some of the second growth is large enough to be cut for lumber, and a considerable part of it is of sufficient size to be boxed for turpentine (pl. 2, *A*). The naval stores industry is of some importance, and a few turpentine stills (pl. 2, *B*) are in operation.

Bainbridge is one of the important local markets for agricultural products. Factories for the shelling of both peanuts and pecans, sawmills, a stave factory, a crate factory, and the railroad shop of the Seaboard Air Line Railway are located there. Besides these industries, it has a bottle-washing-machine factory, and a small brick-manufacturing plant, as well as other small industries, which furnish full- or part-time employment to a number of employees. Attapulgus in the southeastern part of the county is the center of a large fuller's-earth mining industry, and one of the largest fuller's-earth plants in the United States is located here. Amsterdam, also in the southeastern part, is the Georgia center of production of cigar-wrapper tobacco grown under shade, and has a large tobacco grading, curing, and storing plant. Climax, Faceville, Fowlstown, Brinson, Eldorado, Lynn, and Vada are local markets for farm products in various parts.

Cotton, tobacco, and some sugarcane sirup are shipped to distant markets. Collards and watermelons are grown in the eastern part,

and the seeds are shipped to many parts of the South. A large number of hogs and cattle are raised and sold to the packing houses in Moultrie in Colquitt County, Albany in Dougherty County, and Tifton in Tift County. Poultry is shipped by the carload from Bainbridge.

The Seaboard Air Line Railway traverses the county from southeast to northwest, passing through Attapulgus, Bainbridge, Lynn, and Eldorado. The Montgomery branch of the Atlantic Coast Line Railroad passes east and west through the county by way of Brinson, Cyrene, Bainbridge, and Climax. The River Junction branch of the Atlantic Coast Line Railroad traverses the county from Climax to the southwestern corner by way of Otisca, Fowlstown, Faceville, and Recovery, and a short branch of the Atlantic Coast Line traverses the southeastern part from Otisca to Amsterdam.

The public-road system is being extended and improved. At present two paved roads, United States Highways Nos. 84 and 27, cross the county, No. 84 passing through Brinson, Bainbridge, and Climax; and No. 27 through Eldorado, Lynn, Bainbridge, Attapulgus, and Amsterdam and on to Tallahassee, Fla. Practically all farms are on graded sand-clay roads, which can be traveled in almost all seasons.

Rural mail routes are within easy access of practically every farm. Decatur County has an excellent system of schools, which include many consolidated schools. In all the towns and villages the school buildings are of modern construction. Churches are numerous.

CLIMATE

The climate of Decatur County is oceanic; that is, it is characterized by short mild winters and long warm summers, but no long periods of extreme heat or severe cold occur during the year. During the hottest weather the nights are generally pleasant, and the coldest weather is usually marked only by frosts and occasionally thin ice, forming at night and disappearing early the following day. The normal growing season, or frost-free season, is 248 days. The average date of the last killing frost in the spring at Bainbridge is March 11, and of the first in the fall is November 14, but frost has been recorded as late as April 26 and as early as October 21.

The average annual rainfall, 49.54 inches, is ample for all crops. Normally its distribution is favorable to agriculture. The driest months are October and November.

The climate is well suited to the production of a wide range of staple and special crops and to raising livestock. The normal grazing season covers a period of 9 months, but by planting late-summer grazing crops in spring and winter-grazing crops in the fall, it may be lengthened. Farm work can be carried on practically the entire year, and many crops can be produced with a minimum of effort and risk. Such vegetables as cabbage, peas, carrots, turnips, onions, and collards are commonly grown throughout the winter, and much of the land can be planted to rye, oats, vetch, and Austrian Winter peas. These crops can be grazed lightly by hogs and cattle from the first of January to the first of March and then turned under as a cover crop, or the oats and rye can be left to seed and be harvested in time to be followed by a crop of soybeans or cowpea hay.

Table 1 gives the more important climatic data as compiled from the records of the United States Weather Bureau station at Bainbridge. These data are representative of the county as a whole.

TABLE 1.—*Normal monthly, seasonal, and annual temperature and precipitation at Bainbridge, Decatur County, Ga.*

[Elevation, 119 feet]

Month	Temperature			Precipitation		
	Mean	Absolute maximum	Absolute minimum	Mean	Total amount for the driest year (1921)	Total amount for the wettest year (1919)
	°F.	°F.	°F.	Inches	Inches	Inches
December.....	52.6	83	12	4.00	2.26	3.11
January.....	52.1	84	15	3.89	1.49	3.29
February.....	54.1	88	1	4.57	1.44	8.86
Winter.....	52.9	88	1	12.46	5.19	15.26
March.....	60.8	95	23	4.35	2.59	5.51
April.....	67.6	97	32	3.78	2.15	4.27
May.....	74.8	103	42	3.20	3.25	6.22
Spring.....	67.7	103	23	11.33	7.99	16.00
June.....	80.6	106	48	4.84	1.61	5.41
July.....	81.9	106	60	6.53	5.01	12.09
August.....	81.5	106	59	5.74	3.84	9.28
Summer.....	81.3	106	48	17.11	10.46	26.78
September.....	78.3	102	42	4.09	.78	2.83
October.....	68.1	99	28	2.32	3.47	.92
November.....	58.5	91	20	2.23	2.06	3.63
Fall.....	68.3	102	20	8.64	6.31	7.38
Year.....	67.6	106	1	49.54	29.95	65.40

AGRICULTURAL HISTORY AND STATISTICS

The agriculture of Decatur County began slightly more than 100 years ago on the well-drained lands along Flint River, Spring Creek, and other large streams. The early agriculture consisted of growing corn and a small amount of wheat, potatoes, and garden vegetables. Hogs and beef cattle were introduced at an early date and, along with various timber products, were sold for export trade.

About 25 percent of all land in the county is devoted to the production of crops. A considerable acreage is devoted to plowable pasture and a large acreage to woodland pasture. The agriculture consists principally of the production of corn, peanuts, cotton, velvet-beans, and cigar-wrapper tobacco. Sweetpotatoes, sugarcane, watermelons, oats, hay, pecans, a wide variety of garden vegetables, and some fruits are also produced.

Since 1880, and possibly before, more land has been devoted to the growth of corn than of any other one crop. According to the 1935 census, 54,158 acres were devoted to the production of corn in 1934, which yielded 472,358 bushels. Corn is used mainly for fattening hogs, for feeding work animals, and is ground into meal for home consumption.

With the invention of the cotton gin, cotton became the principal cash crop. Peanuts and tobacco are also leading cash crops and to

a less extent sweetpotatoes, watermelons, sugarcane sirup, and pecans.

The acreage occupied by oats was large for many years but has gradually decreased and in 1934 was 333 acres.

Since 1880 the acreage devoted to peanuts has consistently increased, until in 1929 peanuts occupied the second largest acreage of any crop. Some of the peanuts are used for fattening hogs in fall and winter, and many are threshed and sold.

Sweetpotatoes and sugarcane, grown generally for home use and for a limited local market, have occupied rather constant acreages.

Cigar-wrapper tobacco, grown under shade (pl. 3, A), has for many years occupied an important place in the agriculture of the southeastern part of the county. For a short time before 1930 bright-leaf tobacco was grown by many farmers of other parts, but since that year only a small amount has been grown by a few farmers along the eastern county line.

In the last few years, a few pecan groves have been set out. In 1919 there were 5,932 trees of bearing age and 10,831 in 1929. The 1935 census reports 5,939 peach trees of bearing age, 2,697 pear trees, and 309 apple trees. During the last few years several tung-tree grooves have been planted, but as tung oil is a new crop in the United States, the trees are not yet of bearing age. Though no census data are given on velvetbeans, they occupy a very important place in the cropping system on practically every farm.

Table 2 indicates the trend in acreage of the principal crops grown in stated years.

TABLE 2.—*Acreage of principal crops in Decatur County, Ga., in stated years*

Crop	1879	1889	1899	1909	1919	1929	1934
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Corn.....	30,847	32,135	59,817	49,061	80,702	33,583	54,158
Oats.....	9,252	5,991	5,107	6,238	6,403	289	333
Sweetpotatoes.....	1,850	979	1,604	1,458	2,319	1,046	1,482
Peanuts.....		3,249	7,130	10,089	18,960	19,225	38,410
Tobacco.....	2	75	1,261	1,404	882	1,336	483
Cotton.....	29,509	28,257	21,632	29,216	22,475	11,986	8,335
Hay.....				2,103	5,793	6,647	9,336
Sugarcane.....	737	794	1,917	1,194	1,749	852	1,108

The number of cattle on farms was greater in 1935 than in 1930. Hogs and pigs decreased from 25,815 in 1930 to 20,837 in 1935. Mules increased and horses decreased between 1930 and 1935.

Under normal conditions commercial fertilizer is used on nearly all of the cultivated land. Most of the fertilizer is bought ready mixed, but on some of the larger farms, especially the tobacco farms, home-mixed fertilizers are used. The use of commercial fertilizer has decreased since 1930. The Farm Bureau estimates that in 1932 about 1,000 tons of commercial fertilizer, which is one-fourth to one-third the normal amount, was used. For cotton from 400 to 500 pounds an acre of a 4-10-4² mixture are applied; for corn about 200 pounds an acre of an 0-8-6 mixture; for peanuts, about 200 pounds an acre of an 0-10-4 mixture; for shaded tobacco, about 1 ton of a 4-8-6 mixture plus another ton of cottonseed meal an acre; and for bright-leaf tobacco, 1,000 pounds an acre of a 3-8-5 mixture.

² Percentages, respectively, of nitrogen, phosphoric acid, and potash.



A, Cigar-wrapper tobacco growing under shade; *B*, Longleaf pines on Norfolk sand 7 miles northwest of Bainbridge.

Under present conditions common farm labor is very plentiful and may be hired at less than 50 cents a day with board or 75 cents a day without board. Monthly wages range from \$12 to \$20, provided the laborer is furnished a house, a small garden, and free range for cows and hogs.

The size of farms in the county varies considerably, ranging from 10 acres to more than 5,000 acres. According to the 1935 Federal census, the average size of farms was 124.2 acres. The number of farms in 1935 was 2,016. In 1935, the average value of land and buildings a farm was \$1,640.

In 1935, 44.3 percent of the farms in the county were operated by the owners, 54.8 percent by tenants, and 0.9 percent by managers. In later years the tendency has been to clear more land and rent it to tenants. In that part which is devoted to tobacco production, the percentage of owner-operated farms is greater than in other parts. In some places, large tobacco companies own the land and operate the farms with hired labor.

Two systems of rental most commonly used are: (1) Standing rent—the tenant pays a cash rent for each acre, the owner furnishing land, houses, and fences, and getting only cash in return. (2) Sharecropping—the landowner furnishes land, houses, fences, teams, feed, implements, half the seed, and half the fertilizer and in return gets half the crop produced and the tenant furnishes all the labor. Other systems of rental are used to a limited extent.

On most farms, the buildings are generally large, well-built, and well-maintained, and some have electric lights and running water. The tenant houses are small and unpainted. The average farm has a small unpainted house and barn having a small hayloft, two sheds for storing machinery, and another rather open shed for milking and for the storage of feed. The machinery consists of one- and two-horse wagons, a hay mower and rake, a two-horse turnplow, two to three one-horse turnplows, a disk harrow, a spiketooth harrow, a stalk cutter, a two-horse walking cultivator, two to three single or "haymon" plowstocks, a one-horse fertilizer distributor, a one-row cotton planter, a one-row corn planter, and a one-horse weeder. Some farms have a cane mill and a cooking vat or kettle for making sirup. Only a small number of tractors are in use.

The tobacco farmers in the southeastern part have, on the average, better homes, barns, and equipment and, since their work is more specialized, have fewer cattle and hogs than farmers elsewhere in the county. Each of these farms has a tobacco-curing barn; special tools for setting, watering, and spraying tobacco plants; and wire, lattice, and cheesecloth for shades. Most of the farmers on these farms hire laborers, who live in two- or three-room houses.

The average farm has from two to three mules for work animals, and an occasional farm uses one horse to supplement the work of the mules. Most farmers keep from 4 to 10 cattle. Of these, 1 to 4 are milked, and the remainder are raised for beef and sold in winter after grazing. From 5 to 20 hogs, including 2 brood sows, are raised on the average farm. Of these 3 to 8 hogs are butchered each winter for home consumption and the others are sold to packers who buy at local loading stations. Some hogs and cattle are bought at the farm by pick-up buyers on trucks.

SOIL-SURVEY METHODS AND DEFINITIONS

Soil surveying consists of the examination, classification, and mapping of soils in the field.

The soils are examined systematically in many locations. Test pits are dug, borings are made, and exposures, such as those in road or railroad cuts, are studied. Each excavation exposes a series of distinct soil layers, or horizons, called, collectively, the soil profile. Each horizon, as well as the parent material, is studied in detail; and the color, structure, porosity, consistence, texture, and content of organic matter, roots, gravel, and stone are noted. The reaction of the soil,³ and its content of lime and salts are determined by simple tests in the field. The drainage, both internal and external, and other external features, such as the relief, or lay of the land, are taken into consideration, and the interrelation of soils and vegetation is studied.

The soils are classified according to their characteristics, both internal and external, special emphasis being given to those features influencing the adaptation of the land for the growing of crop plants, grasses, and trees. On the basis of these characteristics, the soils are grouped into classification units. The three principal ones are (1) series, (2) type, and (3) phase. In places two or more of these principal units may be in such intimate or mixed pattern that they cannot be clearly shown separately on a map, but must be mapped as (4) a complex. Areas of land, such as coastal beach or bare rocky mountainsides, which have no true soils, are called (5) miscellaneous land types.

The most important of these groups is the series, which includes soils having the same genetic horizons similar in their important characteristics and arrangement in the soil profile, and developed from a particular type of parent material. Thus the series includes soils having essentially the same color, structure, and other important internal characteristics, and the same natural drainage conditions and range in relief. The texture of the upper part of the soil, including that commonly plowed, may vary within a series. The soil series are given names of places or geographic features near which they were first found. Thus Norfolk, Tifton, Greenville, and Grady are names of important soil series in this county.

Within a soil series are one or more soil types, defined according to the texture of the upper part of the soil. Thus the class name of the soil texture, such as sand, loamy sand, sandy loam, loam, silt loam, clay loam, silty clay loam, and clay, is added to the series name to give the complete name of the soil type. For example, Norfolk sand and Norfolk sandy loam are soil types within the Norfolk series. Except for the texture of the surface soil, these soil types have approximately the same internal and external characteristics. The soil type is the principal unit of mapping and because of its specific character is usually the soil unit to which agronomic data are definitely related.

A phase of a soil type is recognized for the separation of soils within a type which differ in some minor soil characteristic which

³ The reaction of the soil is its degree of acidity or alkalinity, expressed mathematically as the pH value. A pH value of 7 indicates precise neutrality, higher values alkalinity, and lower values acidity.

may, nevertheless, have an important practical significance. Differences in relief, stoniness, and the degree of accelerated erosion are frequently shown as phases. For example, within the normal range of relief for a soil type, there may be parts which are adapted to the use of machinery and the growth of cultivated crops and other parts which are not. Even though there may be no important differences in the soil itself or in its capability for the growth of native vegetation throughout the range in relief, there may be important differences in respect to the growth of cultivated plants. In such an instance the more sloping areas of a soil type may be segregated on the map as a sloping or hilly phase. Similarly, soils having differences in stoniness may be mapped as phases, even though these differences are not reflected in the character of the soil or in growth of native plants.

The soil surveyor makes a map of the county or area, showing the location of each of the soil types, phases, complexes, and miscellaneous land types, in relation to roads, houses, streams, lakes, section and township lines, and other local cultural and natural features of the landscape.

SOILS AND CROPS

Decatur County has many different soils ranging from the light-colored sands to red mellow fine sandy loams, and there are some small areas of heavy soils, rough broken land, and swamp. This is owing to the different underlying materials that have weathered and to the action on these weathered products by the soil-forming processes under various conditions of drainage, relief, and plant and animal life. The accompanying soil map shows that 54 percent of the total land area comprises sands, fine sands, loamy sands, and loamy fine sands. These soils occupy most of the western and northern parts and small scattered areas in the southeastern part. A large percentage of these soils, although they occupy favorable positions for agriculture, are not cultivated because of their inherent low fertility. In the southeastern part the so-called "red lands", or the red and brown sandy loams and fine sandy loams, are well developed. These are considered the best agricultural soils for the production of corn, oats, and hay crops, and cigar-wrapper leaf tobacco grown under shade. On the gray sandy loams and fine sandy loams and the deep phases of these soils is grown all of the bright-leaf flue-cured tobacco. The soils are also well suited for the production of cotton, sweetpotatoes, watermelons, and truck crops. The sandy loams and fine sandy loams of the Tifton, Magnolia, Greenville, Faceville, and Norfolk series compare favorably with the best soils in the South Atlantic Coastal Plain.

The crops grown, and the adaptation of these soils to special crops are directly related. These data are brought out in the descriptions of the individual soil types.

The soils, based on their characteristics and agricultural use, are grouped as follows: (1) Soils with gray surface soils and yellow friable subsoils; (2) soils with red or gray surface soils and red friable subsoils; (3) soils with gray surface soils and mottled heavy clay subsoils; (4) soils with gray sand surface soils and sand subsoils; and (5) miscellaneous land types. In the following pages, the

soils are described in detail, and their agricultural relationships are discussed; their distribution is shown on the accompanying soil map; and their acreage and proportionate extent are given in table 3.

TABLE 3.—*Acreage and proportionate extent of the soils mapped in Decatur County, Ga.*

Type of soil	Acres	Per- cent	Type of soil	Acres	Per- cent
Norfolk sandy loam.....	10, 112	2.6	Cuthbert fine sandy loam.....	4, 288	1.1
Norfolk sandy loam, deep phase.....	11, 712	3.0	Leaf clay loam.....	2, 368	.6
Norfolk fine sandy loam.....	12, 160	3.1	Grady sandy loam.....	7, 680	2.0
Norfolk fine sandy loam, deep phase.....	1, 472	.4	Grady sandy loam, slough phase.....	4, 288	1.1
Tifton sandy loam.....	7, 040	1.8	Grady clay loam.....	1, 792	.5
Tifton fine sandy loam.....	3, 328	.8	Grady clay loam, slough phase.....	111, 360	28.4
Dunbar fine sandy loam.....	2, 048	.5	Norfolk sand.....	34, 048	8.7
Kalmia fine sandy loam, mixed phase.....	9, 152	2.3	Blanton fine sand.....	3, 712	.9
Cahaba fine sandy loam.....	4, 096	1.0	Blanton sand.....	8, 640	2.2
Magnolia sandy loam.....	8, 064	2.1	Kalmia sand.....	8, 448	2.2
Magnolia fine sandy loam.....	2, 368	.6	Kalmia fine sand.....	6, 464	1.7
Faceville sandy loam.....	9, 472	2.4	Faceville loamy sand.....	23, 488	6.0
Faceville sandy loam, deep phase.....	6, 400	1.6	Plummer loamy fine sand.....	15, 808	4.0
Faceville fine sandy loam.....	8, 600	2.0	Guin soils, undifferentiated.....	8, 512	2.2
Greenville sandy loam.....	7, 936	2.0	Swamp.....	21, 376	5.5
Greenville fine sandy loam.....	512	.1	Mine pits and mine dumps.....	448	.1
Flint fine sandy loam.....	18, 176	4.7			
Susquehanna fine sandy loam.....	2, 944	.8	Total.....	391, 680	-----
Susquehanna sandy loam.....	3, 328	.8			

SOILS WITH GRAY SURFACE SOILS AND YELLOW FRIABLE SUBSOILS

The group of soils with gray surface soils and yellow friable subsoils includes Norfolk sandy loam; Norfolk sandy loam, deep phase; Norfolk fine sandy loam; Norfolk fine sandy loam, deep phase; Tifton sandy loam; Tifton fine sandy loam; Dunbar fine sandy loam; Cahaba fine sandy loam; and Kalmia fine sandy loam, mixed phase. These soils comprise a total area of 95.5 square miles, or 15.5 percent of the total land area of the county. They are well developed throughout the eastern, southern, and south-central parts. They have flat, almost level, undulating to gently rolling relief and, for the most part, are naturally well drained.

With the exception of Cahaba fine sandy loam, all the soils in this group are predominantly gray in the surface horizon and have yellow friable sandy clay or fine sandy clay subsoils. Of the sandy loams mapped in the county, the soils of this group are lightest in color, lightest in texture, and most friable throughout the profile. All these soils are naturally low in organic matter, as indicated by their light color, and they are leached of most of the soluble plant nutrients; but their physical properties are so favorable that they respond readily to the application of commercial fertilizers and barnyard manure, and to the turning under of green-manure crops.

The soils of this group are particularly well adapted to the production of general farm crops, and they are the only soils in the county on which bright-leaf tobacco is grown. They are well adapted to, and are used extensively for, the production of cotton, peanuts, sweetpotatoes, watermelons, and velvetbeans. A large acreage is devoted to corn. Norfolk fine sandy loam and Norfolk sandy loam are well suited to the growing of tobacco under shade. All these soils are very easy to cultivate, and hand tools or light machinery can be used advantageously.

Norfolk sandy loam.—The 2- to 4-inch surface layer of Norfolk sandy loam in forested areas is gray or brownish-gray loamy sand containing a noticeable quantity of organic matter. In cultivated fields the 5- to 7-inch surface layer is light-gray or grayish-yellow loamy sand. This is underlain by yellow loamy sand which extends to a depth ranging from 12 to 16 inches. A 2- or 3-inch layer of yellow sandy loam, which represents the gradation from the loamy sand layer to the sandy clay subsoil, is noticeable in most places. The subsoil, which extends to a depth ranging from 30 to 38 inches, is yellow friable and crumbly sandy clay of uniform color. Beneath this is mottled yellow, light-red, or reddish-brown and light-gray slightly compact but brittle sandy clay material. In places the sandy surface soil is deeper and may range in texture from rather coarse loamy sand to fine loamy sand. On some of the flatter areas the surface soil is darker, owing to organic matter, and the subsoil, where drainage is imperfect, becomes mottled with gray to a depth ranging from 20 to 30 inches. In areas adjoining Grady sandy loam, the subsoil is generally heavier in texture and decidedly mottled. In some spots a few small rounded brown or black concretions are scattered over the surface and mixed with the surface soil and subsoil.

Norfolk sandy loam is developed mainly on the upper plain in the eastern and south-central parts of the county. Some of the largest areas occur east of Black Lake, near Climax, and around Fowlstown. Smaller areas are scattered here and there, more particularly along the eastern border and in the vicinity of Attapulgus.

Norfolk sandy loam has a flat, almost level to undulating, and gently rolling relief, and both surface and internal drainage are well established. It is perhaps slightly better drained than Norfolk fine sandy loam because of its more open structure and coarser texture of both surface soil and subsoil.

Probably 50 percent of Norfolk sandy loam is cleared and under cultivation. The remainder supports a second growth of longleaf, loblolly, and slash pines, and a few oaks, hickory, and other hardwoods. Wire grass flourishes on this soil and affords some pasturage.

Cotton and corn are the main crops, a considerable acreage is devoted to peanuts and sweetpotatoes, and a small acreage to bright tobacco and cigar-wrapper tobacco grown under shade. In addition, a wide variety of garden vegetables, a few pecans, and some early truck crops are grown. It also produces a fine quality of sugarcane sirup. Cotton yields from one-third to 1 bale an acre; corn, 12 to 30 bushels; peanuts, 40 to 75 bushels; sugarcane, 80 to 200 gallons of sirup; bright flue-cured tobacco, 500 to 700 pounds; tobacco grown under shade, 1,000 to 1,400 pounds; and sweetpotatoes, 100 to 250 bushels. Velvetbeans, rye, and Austrian Winter peas grow fairly well.

Cotton receives from 300 to 500 pounds of 4-8-4 or 4-10-4 fertilizer an acre; corn following velvetbeans, 200 to 300 pounds of 0-8-6; peanuts, 200 to 300 pounds of 0-10-4; bright tobacco, 1,000 pounds of 3-8-5; and cigar-wrapper tobacco grown under shade, 2,000 pounds of 4-8-6 and 1 ton of cottonseed meal. Some farmers apply from 75 to 100 pounds of nitrate of soda an acre to cotton and corn as a side dressing. Sweetpotatoes receive from 300 to 500 pounds of 3-8-5 an acre.

The fertility of this soil can be increased by turning under velvet-beans or Austrian Winter peas and by making heavy applications of commercial fertilizer. It is very easily tilled, responds readily to fertilizer or manure, and warms early in the spring. One of the special needs of the soil is organic matter. The soil is strongly acid, and in growing leguminous crops and peanuts the addition of a liberal amount of lime is recommended.

Norfolk sandy loam, deep phase.—Norfolk sandy loam, deep phase, differs essentially from typical Norfolk sandy loam in that the surface soil is deeper looser loamy sand. The underlying sandy clay is reached at a depth ranging from 18 to 28 inches. Under cultivation the surface soil to plow depth is grayish-yellow or light-gray loamy sand. Some of the areas of this soil southwest of Faceville have a deeper yellow subsoil than is typical of this phase, and a noticeable quantity of small rounded brown iron concretions are on the surface.

Norfolk sandy loam, deep phase, is widely scattered over the county. It occurs in close association with Norfolk sandy loam, Norfolk loamy sand, and Norfolk sand. Some of the larger areas lie west of Johnsons Store in the southwestern corner, northeast of Faceville, northeast of Climax, and in the northwestern part east of Cyrene and northeast of Ausmac.

Norfolk sandy loam, deep phase, has an almost level, undulating to gently rolling surface relief and is everywhere well drained.

About 50 percent of the soil of this phase is under cultivation, and the remainder is forested to longleaf, loblolly, and old-field pines, together with scrub oak, sweetgum, dogwood, and sassafras. The same crops are grown on the deep phase as on typical Norfolk sandy loam, but, under the same treatment, tillage methods, and fertilization, the yields are slightly lower. The yields on this soil are higher than on Norfolk loamy sand or Norfolk sand. A fine quality of bright-leaf tobacco can be produced on the deep phase, but the yields are a trifle smaller than on Norfolk sandy loam. This soil is well adapted to the production of watermelons, sweetpotatoes, and peanuts. It is not so well suited to the growing of cotton and corn as the typical soil.

Norfolk fine sandy loam.—In wooded areas the surface soil of Norfolk fine sandy loam is gray loamy fine sand or fine sandy loam to a depth ranging from 1 to 3 inches and contains a noticeable quantity of organic matter. In cultivated fields the surface soil is light-gray or grayish-yellow loamy fine sand to a depth ranging from 5 to 7 inches. This is underlain by grayish-yellow or pale-yellow fine sandy loam to a depth ranging from 12 to 16 inches. The subsoil is friable and crumbly yellow fine sandy clay which continues to a depth ranging from 32 to 36 inches. This material is underlain by mottled light-yellow, light-red, reddish-brown, and gray friable fine sandy clay. In a few places the surface soil extends as deep as 20 inches, in others the fine sandy clay subsoil may come to within a few inches of the surface. On flatter, imperfectly drained areas the subsoil is heavier and shows a light-gray mottling at a depth of about 30 inches.

Norfolk fine sandy loam comprises an area of 19 square miles. It is developed in a large number of scattered areas on the upper

plain, principally in the eastern and southeastern parts. Some of the largest areas are near Climax, around Bell Dixon School, around St. Mary Church, near Mount Moriah Church, and southwest of Fowlstown.

The relief of most areas ranges from rather smooth to undulating. The forest growth consists, almost entirely, of an excellent stand of longleaf and loblolly pines with a few slash pines.

Norfolk fine sandy loam is one of the best soils in the South Atlantic Coastal Plain for the production of corn, peanuts, cotton, bright-leaf tobacco, tobacco grown under shade, and velvetbeans. Some sweetpotatoes, sugarcane, and oats, and smaller quantities of hay crops and garden vegetables are grown. About 60 percent of this soil is under cultivation. Of the cultivated soil about 20 percent is in cotton, 20 percent in corn, 20 percent in peanuts, and the remainder in various other crops. Corn yields from 15 to 30 bushels an acre, peanuts from 30 to 80 bushels, cotton from one-half to one bale, and sweetpotatoes from 80 to 250 bushels.

Corn receives from 200 to 400 pounds of 0-8-6 fertilizer an acre, peanuts from 200 to 300 pounds of 0-10-4, cotton from 400 to 500 pounds of 4-10-4, bright-leaf tobacco, about 1,000 pounds of 3-8-5, and tobacco grown under shade as much as 2,000 pounds of 4-8-6 and 1 ton of cottonseed meal.

Norfolk fine sandy loam, deep phase.—Norfolk fine sandy loam, deep phase, differs from typical Norfolk fine sandy loam principally in that the loamy fine sand overlying the fine sandy clay subsoil is thicker and somewhat lighter in color and texture.

Norfolk fine sandy loam, deep phase, occupies a small area. It occurs in close association with Norfolk fine sandy loam, and the largest areas are in the southeastern part of the county.

This phase is not so well adapted for farming as typical Norfolk fine sandy loam, but it is used for practically the same crops. Under the same fertilizer treatment and methods of tillage, the yields are lower than on the typical soil. The soil of this phase is capable of producing bright-leaf tobacco of good quality, peanuts, sweetpotatoes, watermelons, and early truck and garden crops. Only a small percentage of Norfolk fine sandy loam, deep phase, is under cultivation, and most of it supports a mixed growth of longleaf and loblolly pines and a few scrub oaks.

Tifton sandy loam.—Tifton sandy loam, locally known as "pebbly land", differs from Norfolk sandy loam in that it is browner, has more fine material throughout the surface soil and subsoil, has a deeper yellow subsoil, and is characterized by the presence of concretions. The surface soil of Tifton sandy loam in wooded areas, to a depth of 3 or 4 inches, is grayish-brown loamy sand containing from 20 to 30 percent of rounded brown or black iron concretions ranging from one-eighth to one-half inch in diameter. In cultivated fields the surface soil, to a depth of 5 or 6 inches, is medium-gray or brownish-gray loamy sand. This is underlain, to a depth of about 12 or 16 inches, by a layer of yellow loamy sand containing a noticeable quantity of pebbles.

The subsoil consists of deep-yellow or reddish-yellow sandy clay which is slightly sticky when wet and friable and crumbly when dry, and it contains a noticeable quantity of iron concretions. In the

lower part of the subsoil, however, the concretions are soft. At a depth ranging from 30 to 40 inches, the subsoil grades into the underlying compact but brittle sandy clay material of mottled whitish gray, yellow, rust brown, and purplish red. At a depth ranging from 5 to 7 feet, the purple color is more noticeable. Numerous pebbles scattered over the surface and throughout the surface soil and subsoil are a conspicuous feature of Tifton sandy loam. These pebbles, which are composed largely of sand cemented by iron, vary considerably in quantity from place to place.

Tifton sandy loam occurs in a large number of areas throughout the southeastern part of the county and occurs to a less extent in the northwestern part. The largest areas are developed near Bethel Church, north and northwest of Attapulcus, and east and southwest of Climax. This soil occupies an almost flat or undulating to gently sloping surface relief and is everywhere naturally well drained. The gently sloping areas in some places are materially affected by sheet erosion, but only a few shallow breaks or gullies have formed in the subsoil.

A large part of Tifton sandy loam is under cultivation. The rest supports a second growth of loblolly and longleaf pines and various species of hardwoods. Wiregrass is abundant over this soil, and around Tifton, Tifton County, Ga., the Tifton soils comprise the so-called "wire-grass section."

Tifton sandy loam is one of the best cotton soils of the county. It is also well suited to the production of corn, oats, hay, and sweetpotatoes, and the Irish Grey variety of watermelon does well. The main crops grown are cotton, corn, peanuts, sweetpotatoes, and sugarcane. This soil is easy to till, responds favorably to fertilization and good treatment, and can be built up to a fair and even to a high state of productivity. Cotton yields from one-third to 1 bale an acre, depending on the amount of fertilizer applied, and corn yields from 15 to 30 bushels. The yields of sweetpotatoes, sugarcane, velvetbeans, and peanuts are good where an adequate amount of fertilizer has been applied.

Part of the experiments conducted at the Coastal Plain Experiment Station at Tifton, Ga., are on a typical development of the Tifton soils. Detailed information as to the proper use of fertilizers for the various crops grown on this soil and as to the best varieties of these crops is given in the bulletins issued by the station.

Tifton fine sandy loam.—The 4- to 6-inch surface layer of Tifton fine sandy loam is dark-gray fine sandy loam containing, in wooded areas, some organic matter. A rather large quantity of iron accretions or concretions are on the surface and mixed with this layer. In places these compose from 20 to 25 percent of the surface soil. To a depth of 12 inches this layer is underlain by a layer of brownish-yellow friable fine sandy loam containing some iron concretions. The subsoil, to a depth ranging from 12 to 38 inches, is deep-yellow mealy heavy fine sandy clay which is sticky when wet and contains some imperfectly formed soft brown concretions. Below a depth of 38 inches, the subsoil becomes mottled with red, purplish-red, and light-yellow splotches and is slightly compact but brittle.

In places where areas of this soil grade into areas of the Norfolk soils the surface layer is thicker, and the color of the surface soil

and subsoil may become more brown or light yellow. The depth of the mottled material may be less in the more level areas.

Tifton fine sandy loam occurs almost entirely on the upper plain in the southeastern part of the county, mostly south and southeast of Climax, north of Attapulgus, and south of Bell Dixon School.

Slightly more than half of this soil is in cultivation, and the rest is in forest and normally produces thicker stands of longleaf pine than any of the other upland soils of the county.

Tifton fine sandy loam is one of the best agricultural soils of the county. It is used for the production of tobacco grown under shade, cotton, corn, peanuts, velvetbeans, oats, sugarcane, and sweetpotatoes and for home gardens. Tobacco grown under shade produces from 1,000 to 1,500 pounds an acre, corn 20 to 35 bushels, cotton one-third bale to $1\frac{1}{4}$ bales, peanuts 50 to 80 bushels, oats 20 to 30 bushels, and sweetpotatoes 75 to 150 bushels. The fertilizers used on this soil are about the same as those used on Norfolk fine sandy loam.

Dunbar fine sandy loam.—Dunbar fine sandy loam, to a depth ranging from 18 to 24 inches, is similar to Norfolk fine sandy loam but below this depth becomes much heavier and more mottled. The 6-inch surface layer of Dunbar fine sandy loam is gray, slightly mottled with brown, light fine sandy loam or loamy fine sand and contains but little organic matter. Below this layer and extending to a depth of 12 inches, the soil becomes light grayish-yellow friable and mellow loamy fine sand slightly mottled with darker shades of yellow and brown. Below this, to a depth ranging from 18 to 24 inches, is a layer of yellow friable and crumbly fine sandy loam faintly mottled with brown. The subsoil is yellow fine sandy clay strongly mottled with red, gray, and brown. It is somewhat sticky when wet and crumbly when dry. When disturbed the material in this layer breaks into irregular fragments. Below a depth ranging from 34 to 40 inches, the subsoil shows less mottling but contains slightly more sand.

Some variations from the type have been included with mapped areas of this soil because of their small extent and various textures. In some places the surface soil is lighter in texture and color and is deeper. Another variation from the typical soil occurs near the sloughs and Sink of the Level in the northeastern part of the county. In these areas the soil is strongly acid. The surface soil becomes somewhat hard when dry and the fine sandy loam cover is thin over the mottled fine sandy clay. A few small areas of sandy loam are also included.

Dunbar fine sandy loam occurs almost exclusively in the northeastern part of the county north of Climax. It occurs on flats generally near some poorly drained areas and, in some places, at the base of the escarpment. Dunbar fine sandy loam has a practically level relief.

About 30 percent of this soil is in cultivation. Corn, velvetbeans, peanuts, cotton, oats, and a few vegetables for home use are grown. Corn produces from 10 to 25 bushels an acre; peanuts, 30 to 60 bushels; cotton, one-fourth to three-fourths of a bale; and oats, 15 to 25 bushels. Fertilizers are used in about the same quantities on Dunbar fine sandy loam as on Norfolk fine sandy loam, but yields are somewhat lower. The tree growth consists of loblolly and slash pines with some sweetgum and other deciduous trees. Carpet grass

and lespedeza do well on the variation of Dunbar fine sandy loam that has the more shallow surface soil. Most of the soil of this variation requires artificial drainage; open ditches serve the purpose.

Kalmia fine sandy loam, mixed phase.—Kalmia fine sandy loam, mixed phase, represents a complex of individual soil types occurring in such small areas and so closely associated that the individual types could not be shown separately on the soil map. Kalmia fine sandy loam is the predominant type; Cahaba fine sandy loam, Myatt fine sandy loam, Leaf fine sandy loam, and Leaf clay loam occur in many small strips and spots; and sand and fine sand occur in a few areas.

A considerable part of Kalmia fine sandy loam, mixed phase, is fairly uniform in color, texture, and structure. The more representative areas have a light-gray loamy fine sand underlain, at a depth of about 5 to 8 inches, by yellow or grayish-yellow loamy fine sand or light fine sandy loam. At a depth ranging from 12 to 20 inches is yellow friable fine sandy clay which, at a depth of about 30 inches, shows some mottlings of brown and gray. Some of this fine sandy clay is slightly compact and hard, whereas some of it is sticky when wet. In some places it has a soaplike feel.

Kalmia fine sandy loam, mixed phase, is developed on terraces along Flint River and Spring Creek and in a few small areas along some of the other large creeks. The largest areas are developed north and northeast of Pattersons Landing, south of Fowlstown Swamp, north of Bainbridge, and north of Muddy Springs.

For the most part, Kalmia fine sandy loam, mixed phase, has an almost level to undulating relief, and natural drainage ranges from fair to good. A number of narrow sloughs or swales are poorly drained, however, and a few low ridges are excessively drained.

Only a small percentage of Kalmia fine sandy loam, mixed phase, is under cultivation. The remainder supports a forest growth of longleaf, loblolly, and shortleaf pines with some sweetgum and haw and a variety of oaks, the hardwoods being confined principally to the more poorly drained areas. Trees make a rapid growth on this soil. Carpet grass does well on the more moist areas. The crops grown on this soil are peanuts, corn, velvetbeans, oats, and some cotton. The yields are usually low unless the soil is heavily fertilized. Some of the more uniformly developed areas are used for growing pecans. The more sandy and more poorly drained areas of this phase should be used for forestry, whereas some of the fairly well drained areas are capable of producing good pasture grasses.

Cahaba fine sandy loam.—Cahaba fine sandy loam in cultivated fields ranges from gray to light-brown loamy fine sand to a depth ranging from about 5 to 8 inches. It is underlain by yellow or brownish-yellow friable loamy sand continuing downward to a depth of about 15 inches. The subsoil is yellowish-brown or reddish-yellow fine sandy clay, slightly sticky in some places and friable in others. At a depth of about 24 to 30 inches, the subsoil becomes mottled with yellow and gray, and, in a few places, small flakes of mica occur. The subsoil is retentive of moisture and holds fertilizers well. Included with this soil as mapped are small areas of Cahaba sandy loam and Cahaba very fine sandy loam, as well as areas in which the surface soil is considerably deeper than that of

typical Cahaba fine sandy loam and small areas where the fine sandy loam covering the yellowish-brown fine sandy clay is very shallow.

Cahaba fine sandy loam occurs on the terraces along Flint River. The largest areas lie southwest of Bainbridge on both sides of the river between Bainbridge and the mouth of Spring Creek.

This soil has an almost level, undulating to gently sloping relief and is naturally well drained. It is not subject to overflow except at times of extremely high water.

Most of Cahaba fine sandy loam has been cleared and is under cultivation, and the rest supports a growth of longleaf and old-field pines, together with some blackjack, turkey, post, laurel, and southern red oaks. Carpet grass grows well on this soil, especially in the lower situations where the moisture conditions are most favorable.

About 60 percent of the cultivated land is devoted to the production of corn, which yields from 10 to 25 bushels an acre. Oats yield from 12 to 30 bushels an acre, cotton from one-fourth to two-thirds of a bale, and peanuts from 30 to 60 bushels. All these crops are fertilized to some extent. The same kind and amount of fertilizer is applied to Cahaba fine sandy loam as to Faceville and Greenville fine sandy loams. Cahaba fine sandy loam is easy to till and responds to good treatment. Some pecan trees are thriving on this soil. The trees grow slowly but when once established are hardy and bear good crops. A few winter cover crops, such as rye, oats, and Austrian Winter peas, are sown between the rows of pecan trees. Some of these crops also are sown in the cotton fields in the fall and are turned under in the spring previous to planting corn. Cahaba fine sandy loam is a good soil for general farming.

SOILS WITH RED OR GRAY SURFACE SOILS AND RED FRIABLE SUBSOILS

The group of soils with red or gray surface soils and red friable subsoils includes all the soils of the Greenville, Magnolia, and Faceville series, except Faceville loamy sand. The combined area of these soils is 66.8 square miles, or 10.8 percent of the total land area of the county. They are developed in many small and fair-sized areas, predominantly in the southeastern part of the county.

These soils have a rather definite topographic position, as they are developed on the high ridges which are undulating or gently rolling and on the slopes leading to the drainageways. All these soils are exceptionally well drained. On some of the more sloping areas terracing is necessary if the land is used for clean-cultivated crops.

The soils of this group are characterized by reddish-brown, red, or gray surface soils and red and reddish-yellow subsoils which are firm but friable. They are underlain by predominantly heavy but brittle and friable sandy clay and fine sandy clay material.

A fairly large percentage of these soils is under cultivation. They are considered the best soils in the county for the production of cigar-wrapper tobacco grown under shade, as well as for the production of cotton, corn, velvetbeans, and oats. Approximately 75 percent of the tobacco grown under shade is on these soils which produce heavier yields than the Norfolk soils, though possibly the quality is not quite so good. These soils do not produce any of the bright flue-cured tobacco.

Magnolia sandy loam.—The 5- to 7-inch surface layer of Magnolia sandy loam in cultivated fields is grayish-brown or gray loamy sand, which grades into brownish-yellow loamy sand or light sandy loam extending to a depth of about 12 inches. This grades into a 2- or 3-inch layer of yellowish-red sandy loam. The subsoil is red firm but friable and brittle sandy clay of uniform color, extending to a depth ranging from 60 to 70 inches. This is underlain by reddish-yellow and purplish-red slightly compact but brittle sandy clay mottled with light gray and yellow. In some of the lower situations enough organic matter has accumulated to impart a dark-gray color to the surface soil. In the forested areas, the 2- or 3-inch layer of the surface soil contains a noticeable amount of organic matter. On some of the slopes and knolls, part of the original surface soil has been removed by sheet erosion, exposing the reddish-yellow subsoil. In a few places, particularly near the bases of some of the slopes, the loamy sand surface layer has accumulated to a depth of 18 or 20 inches. If these areas had been of sufficient size, they would have been mapped as a deep phase. A few small, rounded brown concretions are present here and there on the surface.

Magnolia sandy loam occurs in a large number of areas in the southern half of the county. Some of the largest areas are developed south of Flint River in the southwestern part, north of Faceville, northwest of Fowlstown, and in numerous other places.

Magnolia sandy loam occupies small flat, undulating, gently rolling, or gently sloping areas. All of it is naturally well drained, and most of it can be readily cultivated.

About 55 percent of this soil is under cultivation, and the remainder is forested to second-growth longleaf and loblolly pines, together with a few oaks and hickory in the more open wooded areas. Wire grass and broomsedge constitute the principal grasses.

Magnolia sandy loam is a good soil for general farming. The principal crops are cotton and corn. Some sweetpotatoes, sugarcane, peanuts, velvetbeans, and other crops are grown. A very small acreage is used for tobacco grown under shade. Corn yields from 12 to 30 bushels an acre, cotton one-third to two-thirds of a bale, sweetpotatoes 80 to 150 bushels, and peanuts 50 to 80 bushels. Sugarcane, oats, velvetbeans, Austrian Winter peas, garden vegetables, watermelons, and pecans do well. Practically all these crops are fertilized. Cotton generally receives from 200 to 500 pounds of 4-8-4 or 4-10-4 fertilizer an acre and corn from 200 to 300 pounds of 3-9-3. Both corn and cotton, however, may receive a side dressing of 100 pounds of nitrate of soda an acre. If corn is side dressed with nitrate of soda, 200 pounds of 0-8-6 instead of 3-9-3 are used. Where tobacco is grown under shade, about 2,000 pounds of 4-8-6 and 1 ton of cottonseed meal an acre are applied, and on some farms barnyard manure is used.

Magnolia fine sandy loam.—The surface soil of Magnolia fine sandy loam, to a depth of 5 or 6 inches, is brownish-gray friable fine sandy loam. In forest areas this soil contains a fair quantity of organic matter. At a depth ranging from 5 to 10 inches is a layer of brownish-yellow friable or mellow fine sandy loam underlain to a depth ranging from 12 to 16 inches by yellowish-red slightly sticky or friable fine sandy loam. Below this is a layer, ranging in depth from

16 to 60 inches, of red firm heavy friable fine sandy clay which breaks down readily into a crumbly mass. This layer generally is uniform in color but may show a few soft iron concretions. The subsoil, to a depth ranging from 60 to 70 inches, is reddish-yellow friable light fine sandy clay having some purple mottlings, which are faintly noticeable under wet conditions, also a few iron concretions. Some of this soil mapped along the lower part of the escarpment has a slightly heavier and more plastic subsoil.

Magnolia fine sandy loam occurs principally in the southeastern part of the county and along the base of the escarpment. Some of the main areas are near Mount Nebo Church, northwest of Climax, and in the vicinity of and southwest of Attapulgus.

Magnolia fine sandy loam is an excellent soil for the production of tobacco grown under shade, corn, velvetbeans, peanuts, cotton, oats, sweetpotatoes, and sugarcane. It was one of the first soils cleared on the upper plain, and, as a result of long cultivation without the addition of organic matter or the proper use of commercial fertilizers, the fertility of some of the fields is almost depleted. The sandy nature of the surface soil facilitates cultivation, and the fairly heavy subsoil remains fertile and holds moisture for a long time. About 55 or 60 percent of this soil is under cultivation. Tobacco grown under shade yields from 1,000 to 1,500 pounds an acre, corn 18 to 30 bushels, peanuts 50 to 85 bushels, cotton one-fourth to 1 bale, oats 15 to 25 bushels, and sweetpotatoes from 50 to 100 bushels. The same kinds and quantities of fertilizer are used on Magnolia fine sandy loam soil as on Magnolia sandy loam.

This soil supports some excellent growths of loblolly and longleaf pines, and wire grass furnishes good grazing in these forests.

Faceville sandy loam.—Faceville sandy loam is intermediate in color between Magnolia sandy loam and Norfolk sandy loam. In wooded areas the 2- to 4-inch surface soil is brown or grayish-brown friable loamy sand, but in cultivated areas it is brownish-gray or gray loamy sand, to a depth ranging from 5 to 7 inches. This layer is underlain by brownish-yellow light sandy loam to a depth ranging from 10 to 15 inches. The topmost 2 or 3 inches of the subsoil is yellowish-red or reddish-yellow friable sandy loam which passes into yellowish-red, reddish-yellow, or reddish-brown firm but friable sandy clay extending to a depth of 36 to 40 inches. Below this depth is a mottled reddish-brown, yellow, and light-gray sandy clay material which is slightly compact but friable. In a few places the surface soil is lighter in color and deeper to the underlying sandy clay, whereas in other areas the surface soil is comparatively shallow. A few small, rounded, brown concretions occur here and there on the surface and mixed with the surface soil.

The largest areas of Faceville sandy loam are developed east and northeast of Faceville, northwest of Fowlstown, and northwest of Attapulgus. Many small areas occur throughout the southern part of the county, near the terraces along Spring Creek, and in Attapulgus.

This soil has an undulating, gently rolling, or sloping relief, and both surface and internal drainage are good. The more sloping areas that have been cleared for farming are slightly eroded.

Probably 50 percent of Faceville sandy loam is under cultivation. The remainder is forested to second-growth longleaf and loblolly pines with some small oaks, hickory, and dogwood. This soil originally supported a heavy growth of longleaf pine, among which were some large oaks and hickory.

Cotton, corn, oats, sweetpotatoes, peanuts, velvetbeans, sugarcane, and garden vegetables are grown on this soil. At Attapulcus a small acreage is used for the production of tobacco grown under shade. The crop yields depend largely on the quantity of organic matter in the soil and on the amount of commercial fertilizer applied. Cotton yields from one-third to two-thirds of a bale an acre, but higher yields are obtained by some farmers. Corn yields from 10 to 25 bushels an acre; oats from 15 to 30 bushels; sweetpotatoes 80 to 200 bushels; and sugarcane 150 to 200 gallons of sirup. As a rule the quality of sirup is not quite so good as that produced on the Norfolk soils. Cotton receives from 250 to 400 pounds of 3-8-3 or 4-8-4 fertilizer an acre; corn from 100 to 300 pounds of 3-10-3; sweetpotatoes from 400 to 600 pounds of 4-8-6 or 5-7-5; and sugarcane 400 pounds of 4-8-4. Faceville sandy loam is one of the good agricultural soils of the county, but, like the associated soils, it is deficient in organic matter and mineral plant nutrients. The organic matter content can be supplied by growing and turning under velvetbeans and Austrian Winter peas.

Faceville sandy loam, deep phase.—Faceville sandy loam, deep phase, differs from Faceville sandy loam in that the loamy sand overlying the sandy clay subsoil is deeper and lighter in color and texture. The sandy clay subsoil is reached between depths of 18 and 24 inches. Mapped with this deep phase are small areas of Faceville loamy sand.

Faceville sandy loam, deep phase, occurs in close association with Faceville sandy loam and Faceville fine sandy loam. Most of it is developed in small scattered areas throughout the southern half of the county.

The deep phase of Faceville sandy loam has an undulating, gently rolling, or rolling relief and is everywhere well drained. A large part of it is forested to longleaf, loblolly, and shortleaf pines, together with some oaks and hickory. The more sloping areas should remain in forest.

Practically the same crops are grown as on typical Faceville sandy loam, but the yields are slightly less under the same cultural methods and fertilization. Faceville sandy loam, deep phase, is more difficult to build up and maintain in a productive state than the typical soil.

Faceville fine sandy loam.—In forested areas the 4- to 6-inch surface soil of Faceville fine sandy loam is dark-gray mellow fine sandy loam and, to a depth ranging from 6 to 10 inches, is brownish-yellow fine sandy loam which is underlain to a depth of about 16 inches by light yellowish-brown friable heavy fine sandy loam which crumbles easily. From about 16 to 48 inches is yellowish-brown or reddish-yellow friable fine sandy clay which is very uniform in color, but the cut surface shows a slight yellowish tinge. From 48 to 64 inches, the subsoil is reddish-yellow, mottled with reddish brown, fairly heavy but friable fine sandy clay. At a depth ranging from

64 to 74 inches is slightly stiff but brittle fine sandy clay mottled with shades of yellow, yellowish brown, and light gray.

Faceville fine sandy loam occurs mostly on the upper plain, east of Bainbridge, and near Attapulugus and Amsterdam.

Faceville fine sandy loam is also considered one of the best soils of the county used for the production of tobacco grown under shade and, like the Magnolia soils, was one of the first soils on the upper plain to be cleared. The fine sandy surface soil and the generally level to gently rolling relief make it easy to cultivate. The main crops, in addition to tobacco grown under shade, are corn, cotton, and oats. Some peanuts, sweetpotatoes, and sugarcane also are grown. From 60 to 65 percent of this soil is cultivated. Tobacco yields from 1,000 to 1,400 pounds an acre, corn 15 to 30 bushels, cotton one-fourth to 1 bale, and oats 12 to 25 bushels. Fertilizer applications on Faceville fine sandy loam are similar to those on Greenville fine sandy loam. The forest growth consists of thick stands of loblolly, shortleaf, and longleaf pines with some oak and hickory. These trees make a rapid growth.

Greenville sandy loam.—The surface soil of Greenville sandy loam, to a depth ranging from 6 to 8 inches, is dark-brown or reddish-brown light mellow sandy loam. The subsoil, which extends to a depth ranging from 50 to 60 inches, is red firm slightly compact rather heavy, but fairly brittle and crumbly, sandy clay of uniform color. It is underlain by a mottled yellow, light-gray, and purplish-red heavy, slightly compact but brittle, sandy clay.

Included with Greenville sandy loam are a few areas which have a deeper surface soil of a lighter color. Some of these are near Bainbridge, south of Bainbridge, and in the lower parts of the upland between Flint River and Spring Creek. In the southwestern corner of the county a few areas have a very shallow surface soil, owing to sheet erosion. In two small areas southeast of Attapulugus the surface soil is red clay loam, the subsoil red sandy clay, and the underlying material sandy loam. If such areas were of sufficient extent they would have been mapped as Red Bay clay loam.

Greenville sandy loam is developed in the south-central, southeastern, and extreme southwestern parts of the county. Some of the largest areas are located in Bainbridge and south of Bainbridge. Fair-sized areas are developed south of Attapulugus and south of Amsterdam. A few areas border the terraces along Spring Creek south of Brinson.

The relief of Greenville sandy loam ranges from almost level to gently sloping and rolling. The soil is naturally well drained. Some sheet erosion has taken place in some of the areas having more sloping relief.

Approximately 50 to 60 percent of Greenville sandy loam is under cultivation, the remainder supporting a growth of longleaf and loblolly pines, together with some oak and hickory. Generally more hardwoods grow on the Greenville and Magnolia soils than on the Norfolk and Tifton soils.

Greenville sandy loam is considered one of the best agricultural soils in the county. It is used for the production of cotton, corn, peanuts, velvetbeans, and in the southwestern part for the growing of winter vegetables, such as cabbage and English peas. It is also capa-

ble of producing a good quality of tobacco grown under shade, but very little of this soil lies in the area devoted to the growing of this crop. Corn yields from 15 to 35 bushels an acre, cotton one-third to two-thirds of a bale, peanuts 40 to 75 bushels, and sweetpotatoes 75 to 150 bushels. Velvetbeans and other crops do well. Cotton is given an application of 300 to 500 pounds of 4-10-4; corn 200 to 300 pounds of 3-9-3, or, if velvetbeans have been turned under, 300 pounds of 0-8-6. Some farmers side dress the corn and cotton with 75 to 100 pounds of nitrate of soda.

Greenville fine sandy loam.—The surface soil of Greenville fine sandy loam to a depth of 6 or 7 inches is brown or reddish-brown friable mellow fine sandy loam containing some organic matter. Beneath this layer, to a depth of 40 inches, is a red firm heavy friable fine sandy clay which breaks readily into irregular fragments or lumps. At a depth ranging from 40 to 50 inches is a layer of dark-red compact fine sandy clay, faintly mottled with yellow. Below 50 inches, the subsoil is dark-red compact brittle fine sandy clay streaked with yellow and light gray. In some of the rolling areas the surface layer is thinner, and mottling of the subsoil may be nearer the surface in the flatter areas.

Greenville fine sandy loam is of very small extent. It occurs principally in the vicinities of Attapulugus and Amsterdam and along the lower slope and base of the escarpment.

This soil occupies high undulating to gently sloping areas, and the relief is favorable for general farming. It is naturally well drained. About 60 or 65 percent of this soil is cultivated. It is one of the good soils, being highly prized for the production of tobacco grown under shade, corn, velvetbeans, and cotton, which are the chief crops grown. Some peanuts and sweetpotatoes are also grown. Tobacco yields on this soil range from 1,000 to 1,600 pounds an acre, corn from 20 to 40 bushels, cotton $\frac{1}{3}$ to 1 bale, peanuts 40 to 70 bushels, and sweetpotatoes 75 to 125 bushels. The cultural methods and fertilizer treatment on this soil are similar to those on Greenville sandy loam. Tobacco grown under shade is fertilized with 2,000 pounds of 4-8-6 and 1 ton of cottonseed meal an acre.

SOILS WITH GRAY SURFACE SOILS AND MOTTLED HEAVY CLAY SUBSOILS

The group of soils with gray surface soils and mottled heavy clay subsoils includes both the well-drained and the poorly drained gray soils underlain by clay or heavy fine sandy clay subsoils. The total area of these soils is 71.1 square miles, or 11.8 percent of the total area of the county. The group includes the Susquehanna, Cuthbert, Leaf, Flint, and Grady soils. The Susquehanna and Cuthbert soils are developed on the uplands and generally occupy sloping to rolling relief. They are naturally well drained. The Leaf soils are developed on the terraces along Flint River and to a less extent along Spring Creek. Flint fine sandy loam corresponds very closely in its characteristics to Cuthbert fine sandy loam. The subsoil of Leaf clay loam has somewhat the consistence of the subsoil of Susquehanna fine sandy loam. The Grady soils occur in sinks, slight depressions, or sloughlike areas in the lower plain. They are naturally poorly drained.

Not more than 10 percent of the soils in this group is cultivated. By terracing the Cuthbert and Susquehanna soils and draining

Grady sandy loam, more of these soils could be brought under cultivation. The greater part of the soils in this group, however, should be devoted to pasture and forest.

Flint fine sandy loam.—In forested areas the 3-inch surface layer of Flint fine sandy loam is gray mellow fine sandy loam and in cultivated fields is light-gray or grayish-yellow fine sandy loam. This layer is underlain to a depth of 5 inches by grayish-yellow friable fine sandy loam. At a depth ranging from 8 to 13 inches is a layer of yellowish-brown heavy clay which is hard when dry and breaks into irregular hard fragments. This is underlain, to a depth ranging from 13 to 30 inches, by brownish-yellow heavy clay, mottled with light gray, red, and yellow, which is plastic when wet but hard and brittle when dry. The subsoil, to a depth ranging from 30 to 40 inches, is light gray intensely mottled with light red and yellow. It breaks into small, angular, very hard fragments when dry and is tough when wet. In places the subsoil grades toward yellow, but in other features no differences are noticeable. This soil is underlain by loamy sand in most places, at a depth ranging from 8 to 10 feet.

The relief ranges from almost level, or undulating, to very gently rolling. Although natural surface drainage is good, drainage of the heavy subsoil is slow, and for this reason the soil is not considered well adapted for the production of cotton, which is subject to the attack of boll weevils. The greater part of this soil is forested to loblolly and old-field pines, together with scattered small hardwoods.

Flint fine sandy loam occurs on the terraces of Flint River. Large areas are near West Bainbridge, west of Hutchensons Ferry on the north side of the river, and east of Hales Landing.

Included with this soil in mapping are a few small areas of Flint sandy loam, as the two soils merge in many places. Flint sandy loam is somewhat better drained, as it occurs on higher ridges. Better drainage makes cultivation easier but makes the soil less suited for pasture, as the grasses do not grow so well on the drier areas of deeper sandy soil. A higher percentage of Flint sandy loam is cultivated or used mostly for forest. The two soils where cultivated receive about the same fertilizer and cultural treatment, are planted to the same crops, and yields are practically the same.

Only 5 to 8 percent of Flint fine sandy loam is in cultivation, although a good many areas have been cultivated and later abandoned because of the heavy and rather wet condition of the soil during rainy seasons. The chief crops are corn, peanuts, oats, and cotton, with a few vegetables. Of the cultivated land, probably 60 percent is planted to corn, 15 percent to peanuts, 10 percent to oats and hay, and 15 percent to cotton, vegetables, and other minor crops. Corn yields from 5 to 25 bushels an acre, peanuts 30 to 60 bushels, and oats 10 to 20 bushels. Corn receives from 200 to 300 pounds of 3-8-6 fertilizer an acre and peanuts 300 pounds of 0-10-4. This soil responds readily to the addition of manure and to the turning under of green-manure crops and responds well to fertilizers.

This soil, locally known as "cowhide land", is considered one of the best pasture soils in the county, as the moisture conditions and heavy subsoil seem to promote the rapid growth of carpet grass and lespedeza. A thin stand of pine is growing in many of the pastures but

does not harm the grazing crops to any great extent. Water for cattle can generally be had, with little difficulty, on these areas. The areas of deeper surface soil are recommended for farm crops, the flatter areas for pasture, and the remainder for forestry.

Susquehanna fine sandy loam.—The 2-inch surface layer of Susquehanna fine sandy loam in forested areas is gray mellow fine sandy loam. It is underlain to a depth of 6 inches by brownish-yellow friable fine sandy loam. To a depth ranging from 6 to about 10 inches, the material is reddish-brown heavy tough but plastic clay becoming very hard when dry. At a depth ranging from 10 to 20 inches is a layer of light-red, yellow, and light-gray heavy plastic clay underlain by mottled purplish-red and light-gray heavy plastic clay. In cultivated fields the surface soil is light-gray or grayish-yellow fine sandy loam.

Susquehanna fine sandy loam occurs mainly in the southeastern part of the county on the lower slopes bordering the streams or areas of swamp. A few other areas are developed at the base of the escarpment toward the northeastern part.

Susquehanna fine sandy loam is not a good crop soil, but on the higher areas and where the fine sandy covering is thick some crops are grown. A few areas are farmed where they border large fields of some of the soils having friable red clay subsoils, and these are planted to tobacco grown under shade, corn, cotton, and oats. On this soil tobacco grown under shade yields from 800 to 1,300 pounds an acre, corn 15 to 25 bushels, cotton one-fourth to one-half bale, and oats 15 to 30 bushels. Of the small acreage of Susquehanna fine sandy loam in cultivation, about 50 percent is in corn, 20 percent in cotton, a very small percentage in tobacco, and the rest in oats, peanuts, sweetpotatoes, and other crops.

The tree growth on Susquehanna fine sandy loam consists of short-leaf, loblolly, and a few spruce pine; sweetgum; black gum; dogwood; post oak; white oak; and wild cherry. Broomsedge and carpet grass with some lespedeza are grown for pasture. These do well near the base of the slopes where the moisture conditions are favorable. Unless terraced or strip farmed to grass, this soil erodes badly on slopes under clean cultivation. The best use for most Susquehanna fine sandy loam is forestry or a combination of forestry and pasture.

Susquehanna sandy loam.—Susquehanna sandy loam differs essentially from Susquehanna fine sandy loam in having a coarser texture and somewhat deeper surface soil. Susquehanna sandy loam occurs in a number of small areas in the southeastern part of the county. The largest areas are near Attapulcus. It has a gently rolling to sloping relief which, together with the coarse texture and more open structure, allows good surface drainage. Owing to the heavy subsoil, this soil cannot absorb rain water rapidly, and when the surface soil becomes saturated serious erosion takes place on the steeper slopes.

Only a small percentage of Susquehanna sandy loam is under cultivation. The crops grown, fertilizer treatments, and methods of cultivation are similar to those on Susquehanna fine sandy loam. Because of slightly better drainage conditions, however, larger yields are obtained on Susquehanna sandy loam. Carpet grass and lespedeza

do fairly well near the base of the slopes where the moisture conditions are more favorable. This soil should be devoted largely to forestry.

Cuthbert fine sandy loam.—In wooded areas Cuthbert fine sandy loam, to a depth of about 3 inches, is grayish-brown friable fine sandy loam containing a noticeable amount of organic matter. In cultivated fields the surface soil, to a depth of 5 to 7 inches, is light-gray or grayish-yellow loamy fine sand. Underlying this soil to a depth of about 10 inches is yellow or brownish-yellow fine sandy loam. The subsoil is yellowish-red or yellowish-brown heavy compact clay which breaks into irregular-shaped lumps when dry and is plastic when wet. In most places below a depth ranging from 20 to 30 inches, the subsoil is yellowish-brown hard clay splotted or mottled with shades of yellow, and this, in turn, at a depth of a few inches, is underlain by light-red clay or heavy fine sandy clay, mottled with various shades of yellow. About 90 inches below the surface is streaked or mottled heavy fine sandy clay material, made up of thin laminated layers of light-gray or grayish-white clay and thin layers of red and yellow material which is friable.

Cuthbert fine sandy loam occurs in the southeastern part of the county. It is largely developed along the slopes of the valleys of Attapulcus, Little Attapulcus, and Swamp Creeks.

The relief ranges from undulating and gently rolling to sloping, and natural surface drainage is good. On the more sloping areas that have been cultivated for a few years erosion has been active and destructive. This soil is very susceptible to erosion because the heavy compact subsoil prevents free movement of rain water and allows ready saturation of the surface soil which causes it to slide down the slope.

Only a small percentage of Cuthbert fine sandy loam is under cultivation, most of the rest being forested to slash, loblolly, and long-leaf pines, together with sweetgum, black gum, hickory, dogwood, and holly. Grass and broomsedge grow naturally on this soil, and carpet grass does well on some of the flatter areas and near the base of the slopes.

Some of the smoother areas of this soil are under cultivation to tobacco grown under shade, corn, cotton, oats, and subsistence crops. Only small areas of this soil, mainly in fields where it is associated with better adapted soils, are devoted to the growing of tobacco under shade. The yields of this crop on Cuthbert fine sandy loam range from 900 to 1,400 pounds an acre where heavily fertilized. Corn yields from 12 to 25 bushels, cotton from one-fourth to two-thirds of a bale, and oats from 15 to 35 bushels an acre when fertilized with from 300 to 400 pounds of a 3-8-3 or 4-8-4 mixture.

As the sloping areas of Cuthbert fine sandy loam are subject to erosion, especially where farmed to clean-cultivated crops, it should remain in forest, and only the smoother areas should be devoted to general farming. Some of the smoother areas of the upland and the more gently sloping areas near the base of the slopes can be used advantageously for pasture.

Leaf clay loam.—The surface soil of Leaf clay loam, to a depth of 3 or 4 inches, is gray clay loam, containing some organic matter in various stages of decomposition. The subsurface soil is commonly

light-gray clay loam, slightly heavier than the surface soil. It is somewhat sticky even when only slightly wet. On drying it becomes hard and breaks up with difficulty. At a depth of about 10 inches pale-yellow or grayish-yellow heavy clay loam is reached. This grades, at a depth of about 20 inches, into light-gray stiff heavy tough clay mottled with yellow, yellowish brown, and rather bright red. Below this, at a depth ranging from 30 to 40 inches, the color is more gray, and in places the subsoil becomes lighter, because of the presence of some sand. A few small areas of Leaf sandy loam have been included with Leaf clay loam, as they are not of sufficient extent to be mapped separately.

Leaf clay loam occurs in widely scattered, irregular, generally small areas on the second bottoms of Flint River and occupies, as a rule, the lower positions and sloughs in the Kalmia and Flint soils. Some of the largest bodies of Leaf clay loam lie southeast and northeast of Bainbridge, and smaller strips occur throughout the second-bottom areas southwest of Bainbridge. Southeast of Hutchensons Ferry some areas of Leaf clay loam occupy depressions on the terraces, corresponding to Grady clay loam on the uplands.

Leaf clay loam is difficult to till, and practically all of it requires artificial drainage. Some of the more sandy, higher lying, and better drained areas south of Bainbridge are being cultivated, but crop yields are low.

The forest growth is largely water, laurel, and red (Spanish) oaks; tupelo gum; maple; and May haw. A few loblolly and short-leaf pines grow on the more sandy areas, and carpet grass and lespe-deza grow well on the drier sandy areas. The best use for Leaf clay loam is pasture and forestry.

Grady sandy loam.—The topmost 3 or 4 inches of Grady sandy loam is dark-gray sandy loam containing a considerable quantity of organic matter, and it is slightly sticky when wet. It is underlain by gray heavy sandy loam to a depth ranging from 8 to 12 inches. Below this is a layer of whitish-gray sandy clay loam, which is sticky when wet and hard and brittle when dry. Below a depth of 15 or 20 inches is a layer of gray sandy clay mottled with orange and yellow, which is plastic when wet and hard and compact when dry. Below a depth of 20 or 24 inches the subsoil becomes hard and dry gray sandy clay mottled with yellow, purple, or pink.

Grady sandy loam is scattered over the western and northern parts of the county in what is known as the lower plain. The largest areas lie south of Ausmac and in the northeastern corner.

Grady sandy loam occupies saucerlike depressions, sinks, broad flat areas, and narrow sloughs lying lower than the surrounding soils except other members of the Grady series. Where such depressions or sinks serve as collecting basins or natural drainageways, part of this soil is very wet during rainy seasons. Some areas have subterranean drainage, but the compact nature or consistence of the lower subsoil does not allow free passage of water. Artificial drainage of all this soil is necessary to make it suitable for general farming; some of it could be drained at a reasonable cost.

Only a few areas of Grady sandy loam, to complete or square up the field, are used for crops. The same crops are grown and the same

kinds of fertilizers are used as on the surrounding soil. Yields of crops on this soil are generally low.

Generally thin stands of longleaf and slash pines, black and tupelo gums, May haw, willow, and laurel and water oak grow on this soil. Where the sandy surface soil is thin and drainage is fair, carpet grass and lespedeza do well. If cleared and properly drained the soil is capable of producing fair yields of grain, hay, and pasture grasses. Part of this soil under present drainage conditions will produce good pasturage if seeded to carpet grass, lespedeza, and Dallis grass. This soil is recommended for pasture.

Grady sandy loam, slough phase.—Grady sandy loam, slough phase, is very similar to Grady sandy loam except that it contains less sand in the lower layers and has a somewhat thinner surface soil. The slough phase is more of a continuous slough or many connected sinks. Most of the soil of the slough phase is along Big Slough, which enters the county at the northeast corner and takes a somewhat rambling southwest course, entering Flint River just north of Bainbridge. In times of excessively high waters this slough drains the northeastern part of the county into Flint River.

The soil of the slough phase is farmed in few places, but where farmed the same conditions exist as with Grady sandy loam. The tree growth and pasture grasses are about the same as on Grady sandy loam, and in addition a few maple and cypress trees grow. The best use for Grady sandy loam, slough phase, is for pasture and forestry.

Grady clay loam.—Grady clay loam resembles Grady sandy loam except in texture. The surface soil of Grady clay loam, to a depth ranging from 3 to 5 inches, is dark-gray or bluish-gray clay loam or heavy sandy loam. In most places this is underlain by gray or mottled gray and brown heavy clay, which grades into mottled gray, yellow, rust-brown, and purple tough heavy clay or sticky heavy sandy clay. As Grady clay loam is closely associated with Grady sandy loam, separations on the map are in many places arbitrary.

Grady clay loam is of small extent. Most of it is surrounded by Grady sandy loam or occurs as definite sinks or saucerlike depressions. It is naturally poorly drained, and water stands on the surface a good part of the year. On some of the better drained areas carpet grass does well. The forest growth, which in some places is very sparse, consists of cypress, gums, May haw, ironwood, and several varieties of oaks. The best use for Grady clay loam is for forestry or for a combination of forestry and pasture.

Grady clay loam, slough phase.—Grady clay loam, slough phase, in many respects resembles typical Grady clay loam but is somewhat heavier, containing more clay and practically no sand, and is darker in color throughout the profile. It is found in the sloughs rather than in the isolated sinks and serves as drainageways for the higher lying soils. It is mapped principally in the northeastern part of the county along Big Slough.

The forest growth on this soil is generally free from pine and consists of laurel, water, and red (Spanish) oaks; May haw; ironwood; persimmon; and sweetgum. A few areas contain some wire grass and broomsedge, and in areas free from trees and where water does not stand on the surface carpet grass makes an excellent growth.

None of this soil is under cultivation, as it is generally too wet in the spring to be prepared for crops. The best use for Grady clay loam, slough phase, is for forestry, although in dry seasons it may afford some grazing.

SOILS WITH GRAY SAND SURFACE SOILS AND SAND SUBSOILS

The aggregate acreage of the soils with gray sand surface soils and sand subsoils is larger than the combined acreage of all the other soils in the county. This group comprises 331.2 square miles, or 54.1 percent of the total land area of the county.

This group includes Norfolk sand, Norfolk loamy sand, Blanton sand, Blanton fine sand, Kalmia sand, Kalmia fine sand, Faceville loamy sand, and Plummer loamy fine sand. All these soils except the Faceville and Plummer soils have gray to grayish-white surface soils and yellow to nearly white subsoils. Faceville loamy sand has a grayish-brown surface soil and a yellowish-brown subsoil, and Plummer loamy fine sand has a dark-gray surface soil and a light-gray subsoil.

These sands and loamy sands occupy, for the most part, favorable relief, that is, areas ranging from almost level to undulating and gently sloping. All of them except Plummer loamy fine sand are well drained or excessively drained, except for a few of the flatter areas adjacent to some of the Grady soils.

Only a small percentage of these soils is under cultivation; the rest is forested to second-growth longleaf, loblolly, and old-field pines; scrub, turkey, and blackjack oaks; and a considerable number of live oaks. These soils, on account of their sandy texture and open consistence, are very easily tilled, and light farming implements can be used advantageously. Shallow cultivation, mainly for the killing of weeds and grass, is recommended for these light sandy soils.

The soils of this group are deficient not only in organic matter but also in mineral plant nutrients. They respond readily to applications of commercial fertilizers and manures and to the turning under of green-manure crops. To build them up and maintain them in a productive state is difficult. They are used for the production of corn, peanuts, velvetbeans, cowpeas, and cotton. Scuppernong grapes, garden vegetables, sugarcane, and sweetpotatoes can be grown successfully.

Norfolk sand.—In forested areas Norfolk sand, to a depth of 2 or 3 inches, is gray to dark-gray sand containing some coarsely divided organic matter, which disappears soon after the land has been cleared and cultivated. In cultivated fields the surface is light-gray to grayish-yellow sand to a depth ranging from 5 to 8 inches. The color of the surface soil in all places depends on the amount of organic matter originally present in the soil or supplied through the growing and turning under of green-manure crops. Below the surface layer is grayish-yellow or yellow loose sand extending to a depth ranging from 20 to 30 inches, grading into yellow or slightly brownish yellow sand, which continues downward to a depth ranging from 50 to 60 inches. In some places the lower part of this layer contains enough fine material to make it loamy or slightly sticky. The material at this depth is generally mottled gray, yellow, and brown sandy clay, although in some areas the sand ranges from

5 to 20 feet in thickness. The sandy clay material underlying this sand is nearer the surface over a greater part of the area in Decatur County than in some other places in Georgia and in some of the other Southern States.

In some places a rather arbitrary boundary had to be drawn between Norfolk sand, Faceville loamy sand, and Norfolk loamy sand, because these soils naturally grade into one another. Included with Norfolk sand, therefore, are areas of Faceville loamy sand; Norfolk sand, deep phase, Norfolk loamy sand; Blanton sand; Blanton fine sand; and Norfolk fine sand. In several places in the county a noticeable quantity of almost white siliceous limestone fragments appears on the surface.

Norfolk sand is by far the largest soil type, covering 174 square miles, or 28.4 percent of the total land area. It is developed in all parts of the county but is confined largely to the northern half and to the western part on the lower plain. Some of the largest continuous areas occur between Bainbridge and the Seminole County line, west and north of Eldorado, along the Miller County line on the north, and between Bainbridge and the northeastern corner. Other fair-sized areas occur in the southwestern part near Johnsons Store, and southeast of Faceville.

Norfolk sand occupies almost level, undulating, to gently rolling areas, all of which lie favorably for agricultural use. All of this sand is naturally well drained, although no perennial streams and not many intermittent drainageways occur. The rain water soaks downward through the sand and into subterranean channels. In a few places the layer of sand is deeper over the sandy clay material. Particularly is this true around the Sink of the Level, where the relief is undulating to gently rolling and the sand is excessively drained. A few areas of Norfolk sand occupy slight depressions. These areas contain more organic matter than the typical soil, and better moisture conditions prevail.

About 20 or 25 percent of Norfolk sand is cultivated. A larger acreage formerly was cleared, but some of this land has been abandoned and has grown up to pines and scrub oaks. The rest of the area, which was originally forested to longleaf pine, now supports a stand of young longleaf, loblolly, and old-field pines, which in some places are interspersed with blackjack oak and other scrubby hardwoods. In many places the longleaf (pl. 3, *B*) and loblolly pines more than 6 inches in diameter are used for turpentine. If these pine forests are protected from fires, some valuable timber will be produced and a considerable quantity of turpentine can be obtained within the next 20 or 30 years. Several turpentine stills and small sawmills are now in operation on this soil.

Practically all the farm crops of the county, except tobacco grown under shade, are produced in various amounts on Norfolk sand. The main crops are corn, peanuts, cotton, sweetpotatoes, velvetbeans, sugarcane, and a wide variety of garden vegetables. Depending on the amount and quality of commercial fertilizer applied, the yields of cotton range from one-fourth to one-half bale an acre, corn from 10 to 25 bushels, peanuts from 40 to 50 bushels, and sweetpotatoes from 60 to 150 bushels. In favorable seasons sugarcane produces from 80 to 200 gallons of sirup an acre with heavy applications of

fertilizers. Garden vegetables, Scuppernong grapes, and early truck crops, such as English peas, beans, cantaloups, watermelons, collards, and cabbage, do well. Cotton receives from 200 to 400 pounds of 3-8-3 or 4-8-6 fertilizer an acre. Corn, if preceded by velvetbeans, is given 200 to 300 pounds of 0-10-4. Peanuts are given from 300 to 500 pounds of 0-10-4, sugarcane from 300 to 600 pounds of 4-6-4, and sweetpotatoes from 300 to 600 pounds of 3-8-5. In many places the regular turning under of velvetbeans, together with the addition of commercial fertilizers, has given larger yields on Norfolk sand. Austrian Winter peas, oats, and rye are grown by some farmers as winter cover crops. On Norfolk sand all crops should be grown in rotation with cowpeas or velvetbeans, as the organic matter, or humus content, influences largely the productivity of this soil.

Norfolk sand is deficient in organic matter, which leaches out of the soil rapidly, and can be built up or maintained in a productive state with difficulty. Organic matter can best be supplied by turning under soybeans, velvetbeans, or cowpeas, or by adding barnyard manure. The mineral plant nutrients can be supplied by the application of a complete fertilizer. Norfolk sand gives best yields in ordinary dry seasons or seasons of moderate rainfall. For the greater part, Norfolk sand seems to be best adapted to forestry. Longleaf and loblolly pines do well.

Norfolk loamy sand.—The surface soil of Norfolk loamy sand is light-gray or whitish-gray loamy sand to a depth of 8 or 10 inches. It is underlain by grayish-yellow or pale-yellow loamy sand to a depth of about 28 or 30 inches. Below this is yellow light sandy loam or heavy loamy sand.

Norfolk loamy sand covers a large area in the county, comprising 53.2 square miles, or 8.7 percent. It occurs in practically all parts in rather close geographic association with Norfolk sand and Norfolk sandy loam, deep phase. Many areas are situated in the northern and western parts. Some of the largest areas are north of Cyrene, at Lynn, around Macedonia Church, and north of Mount Pleasant School. Some fair-sized areas are developed in the southern part of the county south of Faceville, and south and west of Johnsons Store.

Some small areas of Norfolk loamy fine sand are included with Norfolk loamy sand in mapping because of their small extent and their similarity. Most of this loamy fine sand occurs in the eastern part of the county in close association with Norfolk fine sandy loam. Very little or none of it is developed on the lower plain.

Norfolk loamy sand has an almost level, undulating to gently sloping relief and is naturally well drained. It warms quickly in the spring and is easily tilled. It will retain moisture and fertility better and will produce higher yields than Norfolk sand but is not so good an agricultural soil as either Norfolk sandy loam or Norfolk sandy loam, deep phase, both of which can be built up to a higher state of cultivation and greater productivity because of their heavier material near the surface. With the exception of tobacco, the crops grown, fertilizer practice, and cultural methods on Norfolk loamy sand are essentially the same as those on Norfolk sandy loam and its deep phase, but yields are lower. Forest growths are very similar, but the stand is thinner on Norfolk loamy sand. The suggestions

for the improvement and handling of Norfolk sand will apply equally well to Norfolk loamy sand. In some sections of Georgia this soil is used for the production of bright-leaf tobacco, sweetpotatoes, and peanuts.

Blanton fine sand.—Blanton fine sand differs from Norfolk sand in that the surface soil contains less organic matter and the subsoil does not have the uniformly yellow color, so noticeable in Norfolk sand. The surface soil of Blanton fine sand is light-gray loose fine sand, 3 or 4 inches thick, underlain to a depth ranging from 12 to 14 inches by very light-gray or pale grayish-yellow loose fine sand. Below this and extending to a depth ranging from 34 to 40 inches is a layer of nearly white loose fine sand splotched with white and yellow. This is underlain by a light-gray fine sand stained with rust brown, somewhat compact and wet during only moderately rainy seasons. At a depth of about 45 to 50 inches, the subsoil becomes very wet light-gray and brown fine sand, containing iron cementations in the form of pebbles and soft iron incrustations.

Blanton fine sand covers a relatively small area in the upper plain section. The largest areas lie between Bainbridge and Mount Nebo Church. Other fair-sized areas occur from 3 to 5 miles south of Bainbridge. Generally it is developed near the foot of slopes close to streams, in a position resembling in some respects a very high terrace. Seepage water often accumulates in the subsoil of Blanton fine sand even when the surface soil is very dry.

Only 8 to 10 percent of Blanton fine sand is in cultivation. Some corn, velvetbeans, peanuts, cotton, and home vegetables are grown. The yields are generally lower than on Norfolk sand, although fertilizer treatment is similar. Corn produces 5 to 15 bushels an acre, peanuts 25 to 40 bushels, and cotton one-fourth to one-half bale. Where large amounts of organic matter are incorporated with this soil some very good vegetable crops have been obtained.

Blanton fine sand is devoted largely to forests of longleaf, slash, and loblolly pines with some sweetgum, and a few oaks are common on the slightly wet ground. Where the surface soil is moist a fair stand of carpet grass, together with some lespedeza, is noticeable.

Blanton sand.—Blanton sand occurs in many small areas throughout the northern half of the county, but the largest area lies immediately south of Faceville. It differs essentially from Blanton fine sand in that the sand grains are medium to coarse in both the surface soil and subsoil. It is developed in close proximity to Norfolk sand, but a considerable part of Blanton sand lies adjacent to the Grady soils on the lower plain. Blanton sand, being coarser in texture and more open in structure, is generally dry to a greater depth than Blanton fine sand. In some places, particularly around the depressions, many siliceous limestone boulders occur.

Because many small areas of Blanton sand are surrounded by a large cultivated area of Norfolk soil probably a larger percentage of Blanton sand than of Blanton fine sand is under cultivation. The crops grown, fertilizer treatment, methods of cultivation, and yields on Blanton sand are essentially the same as on Norfolk sand. The stand of longleaf and slash pine is more scattered on Blanton sand than on Blanton fine sand and Norfolk sand. Only a few of the

flatter and wetter areas of Blanton sand contain enough moisture to support a good growth of pasture grasses. The best use for the greater part of Blanton sand is forestry.

Kalmia sand.—Kalmia sand occurs in fairly large areas on the terraces of Flint River and to a less extent along Spring Creek. The largest areas lie north of Bainbridge and east of Pattersons Landing. West Bainbridge is located on this soil. Kalmia sand lies above normal overflow, but part of it which borders Flint River is overflowed during times of high water. Because of its comparatively high position and its coarse texture and loose structure, this soil is in most places excessively drained.

Kalmia sand is very similar to Kalmia fine sand, except that it is coarser in texture and somewhat lighter in color. It is more droughty than Kalmia fine sand, and as a result the original growth of longleaf pine is scattered. In places turkey oak and other small oak trees grow in considerable numbers. Probably not more than 5 percent of Kalmia sand is under cultivation. Crops, fertilizer treatment, and yields are about the same as on Kalmia fine sand. Under present economic conditions the best use for the greater part of Kalmia sand is forestry.

Kalmia fine sand.—The surface soil of Kalmia fine sand to a depth of about 5 inches is light-gray rather loose fine sand, containing but a small quantity of organic matter. This is underlain by a pale-yellow or grayish-yellow fine sand, extending to a depth ranging from 30 to 40 inches. Below this, to a depth ranging from 45 to 50 inches, is a pale-yellow or whitish-yellow loose fine sand. This is underlain either by light-gray or nearly white fine sand or by sticky light-gray fine sandy clay. In a few places the surface soil is gray fine sand underlain by light-gray fine sand, and such areas are poorly drained. On some of the slight ridges or hummocks the fine sand is light brown.

Kalmia fine sand is developed on the terraces along Flint River, Spring and Mosquito Creeks, and a few of the other creeks. These areas are subject to overflow during times of high water. Kalmia fine sand has an almost level to undulating relief and is well drained or excessively drained under normal conditions.

Only a small percentage of Kalmia fine sand is under cultivation, mainly to corn and velvetbeans. The yields of corn range from 8 to 20 bushels an acre, cotton one-fourth to one-third bale, and peanuts 20 to 35 bushels. All these crops receive a light application of a commercial fertilizer.

The greater part of Kalmia fine sand supports a forest growth of longleaf, slash, and loblolly pines, together with some post, laurel, and turkey oaks. The stands of trees on this soil vary considerably in different parts of the county, depending largely on moisture conditions. On some of the flatter areas where moisture conditions are favorable fair stands of carpet grass are noticeable. Kalmia fine sand is deficient in organic matter and in the mineral plant nutrients. These ingredients leach out of the soil quickly, and it is difficult to maintain Kalmia fine sand in a productive state. The best use for most of this soil is forestry.

Faceville loamy sand.—Faceville loamy sand is predominantly gray or grayish-brown loamy sand to a depth of 8 or 10 inches. It is:

underlain by yellowish-brown, reddish-yellow, or yellowish-red loamy sand which, at a depth ranging from 28 to 33 inches, grades into yellowish-brown or reddish-yellow light sandy loam in some places and into sandy clay in other places. The color of the surface soil varies considerably. Where Faceville loamy sand borders Norfolk sand the surface soil is lighter colored and lighter textured than normally, whereas in some of the slight depressions or flatter areas it contains more organic matter and therefore is darker. The subsoil in some of the flatter areas contains more silt and clay than the typical subsoil.

Faceville loamy sand covers 36.7 square miles, or 6 percent of the total land area of the county. It is developed in many areas in the western part of the county, some of the largest occurring around and north and south of Brinson, and southeast of Bethany Church. Other large areas occur in and north and south of Bainbridge. Many smaller areas are scattered throughout the western part of the county. It is developed in close association with Norfolk sand and Norfolk loamy sand.

Faceville loamy sand occupies broad, almost level to gently rolling areas. It is naturally well drained, even in the more level areas.

A considerable part of this soil has been cleared and cultivated, although some of the once-cultivated areas have reverted to forest. The present forest growth consists of live oaks and other hardwoods interspersed with longleaf and loblolly pines.

Cotton, corn, oats, peanuts, sugarcane, and velvetbeans are grown on this soil. Yields of cotton range from one-third to one-half bale an acre, corn from 8 to 25 bushels, and peanuts from 30 to 50 bushels; yields of oats, sugarcane, and velvetbeans are generally lower. All crops are fertilized with from 200 to 400 pounds of a 3-8-3 or 4-8-4 mixture. Slightly higher yields of some of these crops are obtained where heavy applications of commercial fertilizers or manure have been applied. The recommendations for the improvement and fertilization of Norfolk sand apply equally well to Faceville loamy sand.

Plummer loamy fine sand.—Plummer loamy fine sand, to a depth of about 8 to 14 inches, is gray fine sand, underlain by light-gray loamy fine sand which, at a depth of about 24 inches, changes to grayish-white water-soaked loamy fine sand. Generally at a depth ranging from 30 to 40 inches gray or bluish-gray fine sandy clay mottled with yellow or rust brown is reached. Some areas of Plummer loamy fine sand, to a depth of 3 to 5 inches, have a dark-gray or almost black surface soil owing to the presence of a large amount of organic matter. Plummer loamy fine sand is strongly acid. Included in the mapping of Plummer loamy fine sand are small areas of Plummer sand and Plummer sandy loam.

Plummer loamy fine sand occurs in numerous long narrow strips and small areas throughout the eastern and southern parts of the county. The largest areas lie about 3 to 5 miles northwest of Fowls-town, and other areas lie near Climax. It is developed along the borders of swamps, at the heads of small streams and intermittent drainageways, and on the gentle slopes between the uplands and swamp. Plummer loamy fine sand is naturally poorly drained, as it receives the seepage water from the higher lying soils. This soil is

somewhat difficult to drain because the loamy fine sand materials in the banks of the ditches slough in badly.

This soil supports a tree growth of longleaf, loblolly, and slash pine; black and tupelo gums; and maple; and an undergrowth of gallberry. In many places wire grass or carpet grass grows well. Practically all of this soil is in forest or pasture. Longleaf and slash pines grow rapidly and in a few years can be boxed for turpentine or used for lumber.

The best uses for Plummer loamy fine sand are pasture or forestry, or a combination of both. The Coastal Plain Experiment Station at Tifton, Ga., has demonstrated that Plummer loamy fine sand is capable of producing good pasture grasses.

MISCELLANEOUS LAND TYPES

Miscellaneous land types include those land types which are at present little used for cultivated crops. Practically the only use that can be made of these land types under present economic conditions is forestry or pasture. Guin soils, undifferentiated, are too steep and too sandy for the production of good pasture grasses. The material classed as mine pits and mine dumps is too young and too broken in relief to be used at present for pasturage, but in a few years it may produce trees. The first-bottom or swamp areas in some places can be made to produce good pasture grasses and forest. Where the soil is not too sandy or too wet carpet grass and other grasses grow, even under a scattered stand of trees. The first bottoms of the swamp areas support the best deciduous-tree growth.

The total area of these miscellaneous land types in the county is 47.4 square miles, or 7.8 percent of the total land area.

Guin soils, undifferentiated.—Guin soils, undifferentiated, represent a soil condition rather than a definite soil type. This classification includes areas of Norfolk, Magnolia, Faceville, and Susquehanna soils so small and so intricately mixed that no separation of the individual soils could be made on the soil map.

Guin soils, undifferentiated, are confined almost exclusively to the southwestern and south-central parts of the county and are developed mainly on the northwestern slope of the escarpment from Climax to the southwestern corner. They occur generally as comparatively narrow strips bordering swamp areas or drainageways of the short streams flowing north into Flint River. The largest areas are developed north and northwest of Faceville. This part of the county is more deeply dissected by stream action than any other part, and the relief of Guin soils, undifferentiated, is steep and broken. Drainage ranges from good to excessive, and erosion, particularly gullyng, has been active.

These soils are practically all in forest, consisting principally of longleaf, loblolly, and spruce pines; southern red, post, blackjack, and swamp chestnut oaks; and some hickory, holly, red cedar, and dogwood. A few small areas are in farm crops, but unless care is taken to prevent erosion cultivation of these areas will most likely be relinquished. Under present conditions forestry is the best use for Guin soils, undifferentiated.

Swamp.—Swamp, like Guin soils, undifferentiated, represents a condition rather than a definite soil. The largest continuous areas

occur along Flint River between Bainbridge and the southwestern corner of the county. Other fairly wide and long strips occur along Attapulgus, Willacoochee, and Mosquito Creeks. Narrow strips and small areas of swamp occur in various parts. A large area of swamp lies near the headwaters of Fowlstown Swamp. Swamp areas are subject to overflow several times annually, and they remain saturated or covered with water throughout the greater part of the year.

The soil in swamp areas is so variable in color, texture, and structure that no definite type can be given. In many places it is very sandy, whereas in others a mottled heavy clay is developed. The soils are subject to the deposition of fresh materials at each overflow. Small islandlike areas or low terraces are scattered throughout some of the wider areas of swamp. On these higher positions the soil is dominantly of a sandy character. Only a few small areas of swamp have been cleared and drained sufficiently for pastures. On such areas carpet grass does well and furnishes grazing for cattle during much of the year. Some of the swamp areas are grazed by hogs, as there is a considerable quantity of acorns and nuts in many places.

The tree growth on swamp is varied. In some places along Flint River the growth consists of elm, birch, hickory, ironwood, cypress, swamp chestnut oak, Spanish oak, sweetgum, black gum, and other water-loving trees. Along some of the other streams, a number of large magnolia and bay trees grow in addition to the other trees. The best use for swampland under present economic conditions is forestry.

Mine pits and mine dumps.—Mine pits and mine dumps represent areas where excavations have been made in the mining of fuller's earth and where the refuse and overburden have been dumped. Several areas of mine pits and mine dumps are found in the county. They are restricted to the southeastern part, and the largest areas are south, southwest, and southeast of Attapulgus. Some of the pits are rather deep, large, and contain water most of the time. Some of the recently dumped material supports no forest growth, but some of the older dumps support a growth of loblolly pine. Other areas support a growth of gallberries or broomsedge. The acreage of mine pits and mine dumps has been considerably increased since the soil survey was made. No use other than for forestry is made of the dumped material.

AGRICULTURAL METHODS AND MANAGEMENT

The warm temperature and abundant rainfall, together with the large variety of soils which possess good physical properties, are favorable for a diversified type of agriculture in Decatur County. Many farmers are using their soils for the production of the crops to which they are best adapted under present economic conditions and cropping systems. The agricultural practices in different parts of the county vary according to the characteristics of the soils, and the farmers have endeavored to adjust themselves to the land in such a way that most of them are on a subsistence basis.

All the cigar-wrapper leaf tobacco is grown in the southeastern part of the county, generally on the Magnolia, Greenville, Norfolk, and Faceville fine sandy loams. A small quantity of bright-leaf

flue-cured tobacco is grown in the eastern part, and practically all of it is produced on the Norfolk soils. Norfolk sandy loam, Norfolk fine sandy loam, and their deep phases are recognized as some of the best soils for the production of sweetpotatoes, watermelons, peanuts, and sugarcane. Yields of sirup from cane grown on these soils are not so large as those obtained from cane produced on the red and brown soils, but the sirup is brighter colored and better flavored. The red soils are considered by some farmers to be preferable to the gray soils for the production of cotton, corn, oats, velvetbeans, and Spanish peanuts.

The sands and loamy sands, because of the nearness of the sandy clay in many places to the surface, are more productive in Decatur County than in many other places in the South. After the incorporation of organic matter, together with the addition of mineral fertilizers, fair yields of corn, peanuts, and garden vegetables can be obtained if the seasons are favorable. Some areas of Plummer loamy fine sand and the better drained areas of the Grady soils support fair pasture grasses. Kuduz does well and serves an excellent purpose in preventing erosion on many of the soils with sloping relief. Pecans do well on Cahaba fine sandy loam, as well as on the sandy loams with friable subsoils on the uplands. Spanish peanuts are a profitable crop and if fertilized properly are capable of producing good yields on most of the well-drained soils except the deeper sands.

The farmers recognize that practically all the soils of the county are deficient in organic matter, and they have found that this can best be supplied by growing and turning under leguminous crops, such as vetch, Austrian Winter peas, soybeans, cowpeas, and particularly velvetbeans. Velvetbeans occupy a very important place in the cropping systems on most farms, not only for adding organic matter to the soil but also for the grazing of hogs and cattle in the fall. They also build up and maintain the productivity of the soils. Vetch and Austrian Winter peas may be grown with the oat or rye crop in winter and, instead of being harvested, are turned under shortly before the land is planted to corn. Soybeans, cowpeas, and velvetbeans are either grown with the corn crop or planted after a crop of oats has been harvested, and then turned under in the fall. Soybeans produce by far the best yields if cultivated, whereas cowpeas and velvetbeans do well if sown broadcast. By the use of these green-manure crops the physical condition of the soils will be improved, and the quantity of nitrogen in the commercial fertilizer may be decreased in a few years.

In this warm climate, with the rather heavy rainfall, the organic matter and mineral plant nutrients leach readily from the soils, particularly the more sandy soils. The heavier types hold these constituents, and the productivity of such soils can be maintained at a lower cost. Some of these soils which occupy comparatively steep slopes in the upper plain require terracing to prevent sheet erosion. Practically no terracing is necessary on the soils of the lower plain. In most places where the land is suited to cultivation a broad terrace with rows following the contours of the terrace is sufficient. Drainage is unnecessary for the greater part of the soils, but all the Plummer, Grady, Leaf, and swamp areas require artificial drainage, even for the growing of good pasture grasses. On a few of the flatter

areas of the uplands open ditches may be used advantageously to carry off the excess water from heavy rains. All the soils are mildly to strongly acid. Most of the crops grown do well on acid soils. For the best production of leguminous crops and peanuts, however, the addition of a liberal quantity of lime is recommended.

On some of the better farms the following crop rotations are used, and good results are obtained: Three-year rotation No. 1—first year, corn and velvetbeans with peanuts in every third row for hogs and cattle to graze after the corn has been harvested; second year, cotton, the stalks to be destroyed early in the fall by cutting and disking and the land seeded to oats; and third year, oats, followed by cowpeas or soybeans for hay or to be plowed under for green manure. A winter legume, such as Austrian Winter peas, should be planted in the fall to be turned under in the spring preceding corn. Three-year rotation No. 2—first year, corn and velvetbeans, with peanuts in every second or third row to be grazed by hogs and cattle after the corn has been harvested; second year, peanuts for harvesting; and third year, oats for seed or hay to be followed by cowpeas or soybeans for hay or to be turned under in the fall preceding corn. Where bright-leaf tobacco is planted it generally follows cotton, as the leguminous crops should not be turned under before planting tobacco. On some farms bright-leaf tobacco follows the hay crop where most of the legume crop is removed.

Some of the farmers plant peanuts and velvetbeans with the corn, that is, a row of corn with some velvetbeans a few feet apart in the corn row and a row of peanuts, planted alternately. The corn is harvested and the hogs are turned in to graze on the peanuts and beans. Some oats are grown in winter, and after harvest in early June the land is sown to cowpeas or soybeans for hay. Crabgrass grows with the peas and soybeans, and together make good hay.

A few of the tobacco farmers in the southeastern part of the county grow Spanish peanuts to be harvested and threshed as a cash crop. Cotton and peanuts fit very well into a crop-rotation system. Tobacco is a more specialized crop and does not fit into a rotation like the other farm crops. Disease in cigar-wrapper tobacco has necessitated the limiting of tobacco growth to once or twice in one place and the subsequent selection of a new field. Corn, peanuts, and velvetbeans do well on land following tobacco. They derive the benefits of any residual effects from the heavy fertilization of the tobacco.

Most of the sugarcane is produced in small areas at the bases of slopes or on the more moist soils. In some places the soils are not so well suited to the production of the crops which the farmers are growing, especially the cash crops.

As a rule, cattle and hogs are grazed on native wire grass pastures or on the open range during the spring and summer and as soon as the corn is harvested are turned into the fields for fall and early winter grazing and fattening.

Those farmers having wet lands for pasture, as on farms along the edges of the river or creek terraces, near some of the large Grady sinks, or near the foot of the escarpment which crosses the county, are devoting most of their efforts to raising cattle for market. The cattle are fattened by being pastured on the lowlands during the

spring and summer and supported during the fall and early winter on crops, such as corn and velvetbeans, grown on the well-drained lands. The chief grasses in these pastures are native wire grass and carpet grass, and lespedeza is being used to some extent.

The following recommendations for the improvement of Tifton sandy loam, Norfolk sandy loam, and associated light-colored well-drained soils in Decatur County, are based on results of field experiments carried on for several years at the Georgia Coastal Plain Experiment Station at Tifton, and discussed in its annual report issued June 1931:

For cotton on land in a fair state of cultivation it is recommended that from 800 to 1,000 pounds of 3-9-5 fertilizer an acre be applied at time of planting. About 10 days before the cotton puts on squares it is recommended that a side dressing of from 100 to 150 pounds of nitrate of soda or its equivalent be applied to the cotton.

For corn on the well-drained sandy and fine sandy loams good results have been obtained from the use of 300 to 500 pounds of a 2-10-4 fertilizer an acre. The fertilizer should be applied as a side dressing if the land is in a good state of cultivation. On the more sandy land the fertilizer may best be divided and half of it applied at planting time and the other half added as a side dressing.

For bright-leaf tobacco on Norfolk sandy loam, Norfolk fine sandy loam, and Tifton sandy loam it is recommended that about 1,000 pounds of a 3-8-5 or a 4-8-6 fertilizer an acre be used. In either case it is recommended that the potash be derived from some sulphate and muriate forms, at least half being from a sulphate form to produce good burning qualities in the tobacco.

Oats have given good results on Tifton, Greenville, and Magnolia sandy loams and fine sandy loams when 400 pounds of an 0-10-4 fertilizer was used, with a top dressing of about 100 pounds of nitrate of soda, or its equivalent, an acre applied from February 15 to March 1.

Good yields of peanuts are obtained when a 2-8-4 fertilizer is used. The nitrogen may be omitted where the land is in a good state of cultivation.

Producers of tobacco grown under shade get good results on the Magnolia, Greenville, and Faceville soils with the following fertilizers: 10 to 12 tons of stable manure and 3,000 to 3,500 pounds of a mixture of 1,600 pounds of cottonseed meal, 600 pounds of steamed bonemeal, and 435 pounds of potassium sulphate. One strict requirement in this fertilizer is that practically all the potash be in a sulphate form to give the best burning qualities to the cigar wrappers. Much variation exists in the use of fertilizer for this crop, and very few experimental data on fertilization of the crop are available. Lime in various quantities is necessary for the proper growth of tobacco under shade.

Results obtained during the past several years at the Georgia Coastal Plain Experiment Station indicate that the following varieties of crops are adapted to the soils of this county: Cotton—several strains of Toole, Cleveland, and Cleveland Big Boll; Cook Improved; Dixie Triumph; and Lightning Express; corn—Whatley Prolific, Hastings Prolific, Garrick, Ellis, Piedmont Two-ear, Puckett Improved, Williamson, White Dent, Cocke Prolific, and

Improved Golden Dent; peanuts—North Carolina, McGovern, Improved Spanish, Spanish, and Virginia Bunch; oats—Hundred Bushel, Bancroft, Patterson, Appler, Coker Appler, Red Rust-proof (Red Texas) and Fulghum; bright-leaf tobacco—Jamaica, Yellow Pryor, Cash, and Bonanza; rye—French, Abruzzi, and South Georgia. Soybeans are one of the best hay crops; the Otootan, Biloxi, Laredo, and Tanloxi varieties have shown the best results, with the Otootan apparently superior in quality and yield.

MORPHOLOGY AND GENESIS OF SOILS

Decatur County lies in the Red and Yellow soils region of the United States. The county is wholly within the Atlantic Coastal Plain. The northern two-thirds of the county is on the Dougherty Plain, and the southeastern part, on what is known as the Tifton Upland.⁴ The elevation of the county ranges from about 50 feet to approximately 300 feet above sea level. Except for the swampland along the streams, the Grady sinks and sloughs, and a few places on the terraces, most of the county is well to excessively drained. In the northern and northwestern parts the streams have not affected the relief to any great extent, as these parts of the county are drained largely through subterranean channels, and the constructional form of the land as laid down by the sea is largely maintained.

The soils are prevailingly light in color, the surface soils ranging from light gray to red, indicating that they are poorly supplied with organic matter. As the county was forested until it was reclaimed for agriculture, it lacked the grass cover which is essential to the accumulation of organic matter in the soils. In the wooded areas the soil contains a noticeable quantity of rather coarse vegetable matter near the surface, but the organic matter has not become incorporated in the soil as in areas originally covered with grass. The climatic conditions also have not been conducive to the accumulation of organic matter in the soils.

The normally developed soils show considerable eluviation in the A horizons and illuviation in the B horizons. The soils have been strongly leached, as a result of the prevailingly heavy rainfall and comparatively high temperature. The original carbonates in the parent geological material from which many of the soils have developed have been largely removed to a depth of several feet. In some places on the northwest slope of the escarpment and particularly in the southwest corner of the county erosion is rather serious, and some of the lands once under cultivation have been abandoned and allowed to grow up in brush and trees. All the soils range from slightly acid to strongly acid. Table 4 indicates the acidity of some representative soils in the area. The Norfolk, Grady, Leaf, Kalmia, and Plummer soils are more acid than the Tifton, Magnolia, Faceville, and Cuthbert.

The northern and northwestern parts of the county are underlain by the Vicksburg formation,⁵ which consists of white limestone, sands, and clays, with flint and chert masses. This limestone has

⁴ LA FORGE, L., COOKE, W., KEITH, A., and CAMPBELL, M. R. PHYSICAL GEOGRAPHY OF GEORGIA. Ga. Geol. Survey Bull. 42, p. 17, illus. 1925.

⁵ VEATCH, J. O., and STEPHENSON, L. W. PRELIMINARY REPORT ON THE GEOLOGY OF THE COASTAL PLAIN OF GEORGIA. Ga. Geol. Survey Bull. 26, 466 pp., illus. 1911.

been extensively silicified, but in some places some of it is hard and comparatively pure. In many places the presence of this limestone is evidenced by siliceous fragments on the surface. This formation was covered, to a depth of several feet, by sands and sandy clays, from which most of the Norfolk and Blanton soils are developed.

TABLE 4.—*pH* determinations of eight soils from Decatur County, Ga.¹

Soil type and sample no.	Depth	pH	Soil type and sample no.	Depth	pH
Susquehanna fine sandy loam:	<i>Inches</i>		Faceville fine sandy loam:	<i>Inches</i>	
259606.....	0-2	5.6	259629.....	0-3	5.5
259607.....	2-6	5.8	259630.....	3-10	5.6
259608.....	6-10	5.6	259631.....	10-16	5.4
259609.....	10-20	5.1	259632.....	16-48	5.7
259610.....	20-40	5.1	259633.....	48-64	5.7
Magnolia fine sandy loam:			259634.....	64-74	5.7
259611.....	0-5	5.5	Cuthbert fine sandy loam:		
259612.....	5-10	5.5	259644.....	0-3	6.0
259613.....	10-16	5.4	259645.....	3-10	6.2
259614.....	16-60	6.0	259646.....	10-20	5.4
259615.....	60-70+	6.1	259647.....	20-30	5.2
Flint fine sandy loam:			259648.....	30-50	5.6
259616.....	0-3	5.3	259649.....	At 96	5.0
259617.....	3-8	5.5	Norfolk fine sandy loam:		
259618.....	8-13	5.5	259601.....	0-3	5.4
259619.....	13-30	5.5	259602.....	3-7	4.9
259620.....	30-40	5.5	259603.....	7-15	5.1
Tifton fine sandy loam:			259604.....	15-34	4.7
259624.....	0-6	6.0	259605.....	34-40	4.4
259625.....	6-12	6.0	Grady clay loam:		
259626.....	12-14	5.6	259655.....	0-3	4.5
259627.....	14-38	5.6	259656.....	3-10	4.5
259628.....	38+	5.4	259657.....	10+	4.5

¹ Determinations made by E. H. Bailey, Bureau of Chemistry and Soils, by the hydrogen-electrode method.

In the southeastern part the Altamaha formation, consisting of irregularly bedded sandy clays and sands of varied color, underlies the Greenville, Magnolia, Faceville, and Tifton soils.

Lying between the Vicksburg and the Altamaha formations are two other formations—the Alum Bluff and the Chattahoochee, running in parallel belts. The Alum Bluff formation comprises greenish-gray sands and clays locally indurated, and subordinate beds of fuller's earth, phosphatic sands, and limestones. The Alum Bluff formation underlies a part of the area near and northeast of Attapulgus and Amsterdam. It is in this section that large quantities of fuller's earth are mined.

The Susquehanna and Cuthbert soils are underlain by and derived from beds of clays or heavy fine sandy clays. The Flint and Leaf soils are developed on the terraces from the weathering of the finer sediments which were deposited by Flint River, whereas the Kalmia and Cahaba soils, developed on terraces of Flint River and Spring and Mosquito Creeks, owe their origin to the deposition of coarser materials laid down by these streams when they flowed at much higher levels.

Throughout the county except in restricted areas in the southeastern part slight depressions and sinks are conspicuous. Most of these are shallow, but one is 25 feet deep and about 200 feet in diameter, located about 8½ miles east of Bainbridge. In the bottom of this sink is found white chalky fossiliferous limestone. The Grady soils are confined to these depressions and sinks and have

been influenced in their origin by the solution of the underlying limestone rock.

As regards soil development, Decatur County has two main groups of soils: (1) Those with normal soil profiles and (2) those which have not developed normal soil profiles because of imperfect drainage, imperfect aeration, and steep relief.

The soils which express the influence of the climate and forest cover and have normally developed profiles are Norfolk fine sandy loam, Norfolk sandy loam, and the Tifton, Greenville, Magnolia, Faceville, and Cuthbert soils. The most striking features of the profiles of this group of soils are a comparatively light-textured A horizon and a heavier textured and uniformly colored B horizon. The material which constitutes the substratum, or C horizon, varies greatly in texture and color but is dominantly lighter in texture than the B horizon and heavier than the A horizon.

The soils of the county can best be interpreted by individual profile descriptions at definite locations for a few of the important soils. Such a description of a profile of Norfolk fine sandy loam, $1\frac{1}{2}$ miles east of Antioch Church in the southeastern part, follows:

- A. 0 to 3 inches, gray loamy fine sand containing enough organic matter to give it a dark color.
- A₂. 3 to 7 inches, grayish-yellow or pale-yellow loamy fine sand.
- A₃. 7 to 15 inches, pale-yellow mellow and friable fine sandy loam of uniform color.
- B. 15 to 34 inches, yellow friable fine sandy clay of uniform color, which breaks into irregularly shaped lumps and is easily crushed into a friable mass.
- C. Below 34 to 40 inches, light-yellow fine sandy clay material mottled with reddish brown and light gray; the gray color increases with depth.

The outstanding differences between the Tifton soils and the normally developed Norfolk fine sandy loam and Norfolk sandy loam is the presence of a large quantity of brown, reddish-brown, or almost black rounded and smoothly angular concretions or accretions, ranging in diameter from one-eighth to one-half inch, which occur on the surface, mixed with the surface soil, and to less extent in the subsoil of Tifton soils. On the surface and in the surface soil they are hard, but they occur as small soft aggregates or segregates of brown iron stains in the C horizon. Other differences are better drainage throughout, browner surface soils, deeper yellow or more reddish yellow B horizons, slightly heavier texture, and slight stickiness in the Tifton soils. The C horizon material is redder, also, than that of the typical Norfolk soils.

Following is a description of the profile of Greenville fine sandy loam, $2\frac{1}{4}$ miles south of Attapulgus:

- A. 0 to 7 inches, brown fine sandy loam containing a small amount of organic matter and having a thin covering of leaves and pine needles on the surface.
- B₁. 7 to 40 inches, red rather heavy fine sandy clay of uniform color, which breaks into irregular fragments or lumps that are easily crushed into a friable mass.
- B₂. 40 to 50 inches, dark-red heavy fine sandy clay, slightly compact, which does not crush so easily as the layer above.
- C. 50 inches or more, dark-red heavy fine sandy clay material streaked and mottled with yellow and light gray, rather heavy and slightly compact but brittle.

The Magnolia soils differ essentially from the Greenville soils in that the surface soils of the Magnolia series are lighter in color and contain less fine material, and as a rule the B horizons are brighter red. Unlike the Magnolia soils, the Faceville soils are gray or brown in the surface layers and have reddish-yellow or yellowish-brown fine sandy clay B horizons.

The description of a profile of Cuthbert fine sandy loam, $2\frac{1}{4}$ miles east of Amsterdam and just south of Swamp Creek, is as follows:

- A₁. 0 to 3 inches, grayish-brown mellow and friable fine sandy loam containing a small quantity of organic matter.
- A₂. 3 to 10 inches, brownish-yellow mellow and friable fine sandy loam.
- B₁. 10 to 20 inches, yellowish-brown or yellowish-red heavy compact clay which breaks into irregularly shaped hard lumps when dry.
- B₂. 20 to 30 inches, brownish-yellow or reddish-yellow heavy hard compact clay, spotted and mottled with shades of yellow.
- B₃. 30 to 50 inches, reddish-yellow heavy clay material, mottled with shades of yellow.
- C. 50 inches or more, reddish-yellow heavy clay to fine sandy clay material, somewhat laminated and containing thin layers of whitish or light-gray heavy clay.

The Susquehanna soils differ essentially from Cuthbert fine sandy loam in that the B horizon is a very decidedly plastic clay, mottled with red, yellow, and gray. The upper part of this layer to a depth of a few inches may be reddish-brown or yellowish-brown heavy tough clay. The material in the C horizon consists of thin layers of light-gray smooth heavy clay and streaks of yellowish fine sand or fine sandy clay.

The Grady, Plummer, and Leaf soils, on account of poor drainage and aeration, have not developed normal soil profiles. The vast areas of Norfolk sand, large areas of Norfolk loamy sand, Blanton sands, and Faceville loamy sand owe their origin to beds of sand and light sandy clays, which were laid down in the ocean waters. The Kalmia sands were deposited by the larger streams during times of heavy overflow. None of these sands has a normally developed soil profile.

Miscellaneous land types, including Guin soils, undifferentiated, swamp, and mine pits and mine dumps, represent land conditions rather than soil types.

SUMMARY

Decatur County is in the southwestern part of Georgia, bordering the Florida State line. It contains 612 square miles, or 391,680 acres. It has three main physiographic divisions: (1) The upland plain in the southeastern part, (2) the lowland plain in the northwestern and northern parts, and (3) the river terraces or second bottoms along Flint River. The river terraces and the lowland plains are separated from the highland plains by a well-defined escarpment which runs in a general northeasterly and southwesterly direction. The drainage of these various divisions is very distinct. The southeastern part has a well-defined dendritic drainage system, whereas the lower plain has no perennial streams except Flint River and Spring Creek, and practically all the drainage is subterranean.

Transportation facilities, both by land and water; paved roads; sand clay roads; and markets for farm products are good. A large

quantity of fuller's earth is mined. Lumbering and naval stores production are important industries and are operated in many places in conjunction with general farming. The climate is highly favorable for a diversified agriculture. The sandy loams and fine sandy loams of the Norfolk, Tifton, Greenville, Magnolia, and Faceville series are some of the best soils in the South Atlantic Coastal Plain.

About 22 percent of the soils is farmed. In addition, a considerable acreage is fallow land, some is plowable pasture, and some is woodland pasture. The rest of the county has a second growth of longleaf, loblolly, and old-field pines, together with a variety of small oaks, on the uplands; and hickory, magnolia, elm, ash, May haw, and water oak in the swamps and on the poorly drained soils.

The principal crops are corn, cotton, and peanuts. The cash crops are tobacco, peanuts, and cotton, together with some sweetpotatoes, watermelons, pecans, and a few truck crops. A large number of hogs, cattle, and poultry are sold annually. The tobacco consists of two kinds: The bright-leaf flue-cured tobacco, which is confined to Norfolk sandy loam and Norfolk fine sandy loam and the deep phases of these types; and the cigar-wrapper tobacco, which is grown under shade and produced mainly on the sandy loams and fine sandy loams of the Magnolia, Greenville, Faceville, and Norfolk series in the southeastern part.

The soils are grouped according to their characteristics and crop uses into: (1) Soils with gray surface soils and yellow friable subsoils, (2) soils with red or gray surface soils and red friable subsoils, (3) soils with gray surface soils and mottled heavy clay subsoils, (4) soils with gray sand surface soils and sand subsoils, and (5) miscellaneous land types.

In the first group Norfolk sandy loam, Norfolk fine sandy loam, and the Tifton soils are the predominant types. These soils have light-gray to brownish-gray surface soils and yellow friable sandy clay subsoils. On these soils are grown all the bright-leaf flue-cured tobacco, a large part of the cotton, and the greater part of the sweetpotatoes, watermelons, and peanuts, as well as a wide variety of garden vegetables and some truck crops.

The group having red or gray surface soils and red friable subsoils comprises all the types of the Magnolia, Greenville, and Faceville series except Faceville loamy sand. These soils are developed largely in the southeastern part of the county and belong to the belt of Red soils so characteristically developed in southwestern Georgia and the adjacent area in Florida. These are good, strong agricultural soils, well suited to the production of corn, other farm crops, and peanuts, and producing practically all the cigar-wrapper tobacco grown under shade in the vicinity of Attapulgus and Amsterdam.

The group having gray surface soils and mottled heavy clay subsoils, such as the soils of the Flint, Susquehanna, Cuthbert, Leaf, and Grady series, are markedly distinct in the characteristics of their subsoils from the other soils of the county. The Susquehanna and Cuthbert soils are well drained to excessively drained in the surface layers. The sloping relief, together with the heavy clay subsoils which do not allow the rain water to be absorbed rapidly, renders these soils subject to serious erosion under clean cultivation. The

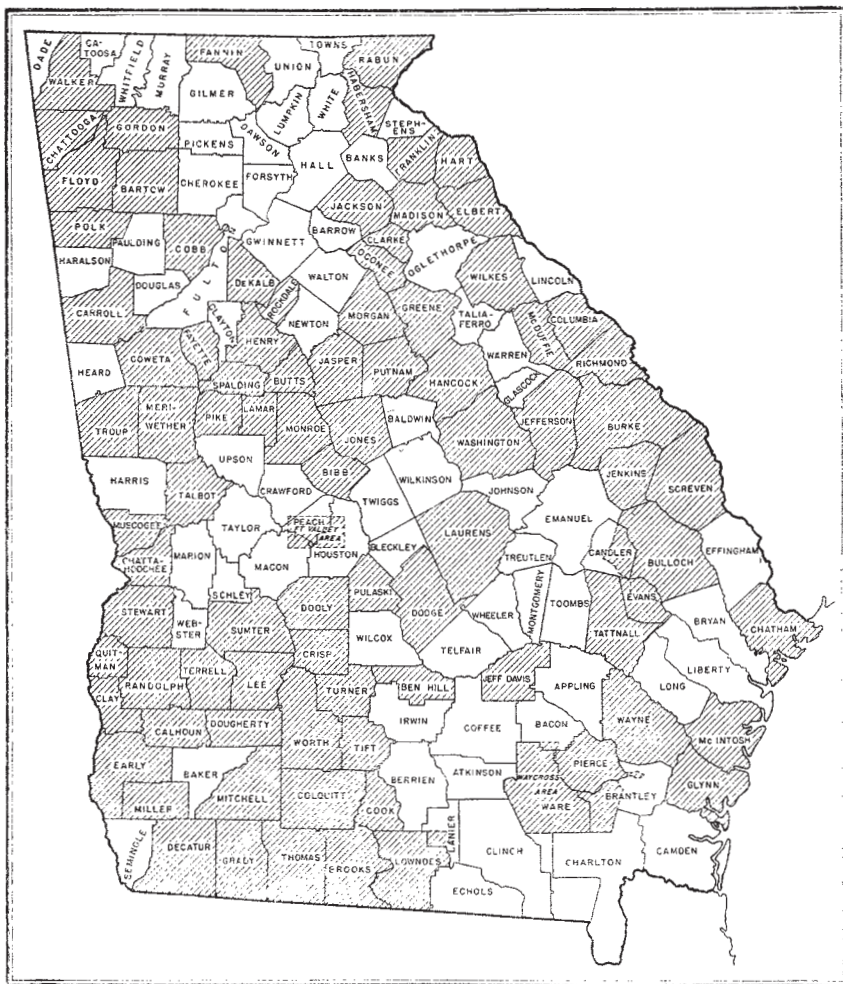
Grady soils occupy low flat areas and are confined to sinks and depressions. They are a conspicuous feature in the topography of the county. Thus far only a very small percentage of these soils is under cultivation.

The soils having gray sand surface soils and sand subsoils cover 54.1 percent of the total land area of the county. Norfolk sand covers the largest area of any member of this group, 174 square miles, or 28.4 percent of the total land area. Probably 20 or 25 percent of these sands and loamy sands is under cultivation. Although they are naturally low in fertility, these soils occupy favorable relief, are well drained, and are easy to cultivate.

The miscellaneous land types, including the Guin soils, undifferentiated, swamp, and mine pits and mine dumps, are used primarily for forestry or pasturage.

Authority for printing soil survey reports in this form is carried in the Appropriation Act for the Department of Agriculture for the fiscal year ending June 30, 1933 (47 U. S. Stat., p. 612), as follows:

There shall be printed, as soon as the manuscript can be prepared with the necessary maps and illustrations to accompany it, a report on each soil area surveyed by the Bureau of Chemistry and Soils, Department of Agriculture, in the form of advance sheets bound in paper covers, of which not more than two hundred and fifty copies shall be for the use of each Senator from the State and not more than one thousand copies for the use of each Representative for the congressional district or districts in which a survey is made, the actual number to be determined on inquiry by the Secretary of Agriculture made to the aforesaid Senators and Representatives, and as many copies for the use of the Department of Agriculture as in the judgment of the Secretary of Agriculture are deemed necessary.



Areas surveyed in Georgia shown by shading. Detailed surveys shown by northeast-southwest hatching.

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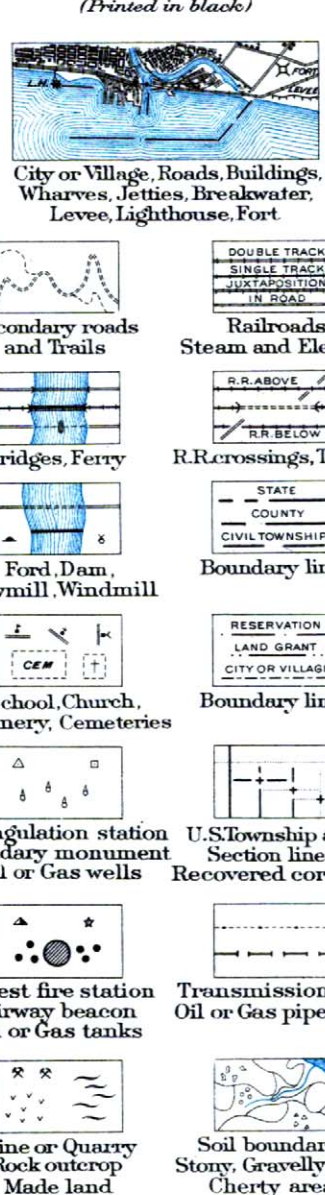
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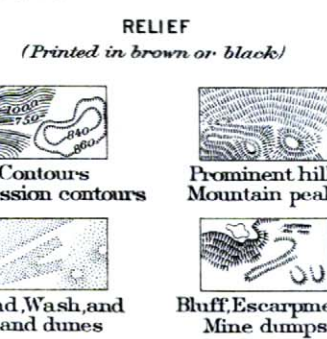
Blanton sand Bs	Flint fine sandy loam FF	Kalmia sand K	Norfolk loamy sand No
Blanton fine sand BF	Gravelly fine sandy loam GI	Kalmia fine sand KF	Norfolk fine sandy loam Ns
Cahaba fine sandy loam CF	Slough phase Q	Kalmia fine sandy loam, Mixed phase KI	Deep phase Ns
Cuthbert fine sandy loam Cu	Gravelly clay loam Gc	Leaf clay loam Lc	Plummer loamy fine sand PF
Dunbar fine sandy loam Ds	Slough phase Gc	Magnolia sandy loam Ms	Susquehanna sandy loam Ss
Faceville loamy sand Fl	Greenville sandy loam Gs	Magnolia fine sandy loam MF	Susquehanna fine sandy loam Sf
Faceville sandy loam Fs	Greenville fine sandy loam GF	Norfolk sand N	Tifton sandy loam Ti
Faceville fine sandy loam Fa	Guin soils (Undifferentiated) G	Norfolk sandy loam NI	Tifton fine sandy loam TF
	Swamp Sw		Mine pits and Mine dumps Mn
			Deep phase Nf

CONVENTIONAL SIGNS

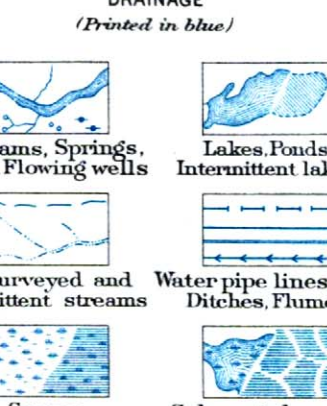
CULTURE
(Printed in black)



RELIEF
(Printed in brown or black)



DRAINAGE
(Printed in blue)



The above signs are in accordance with the soil survey report in some maps of earlier dates.

